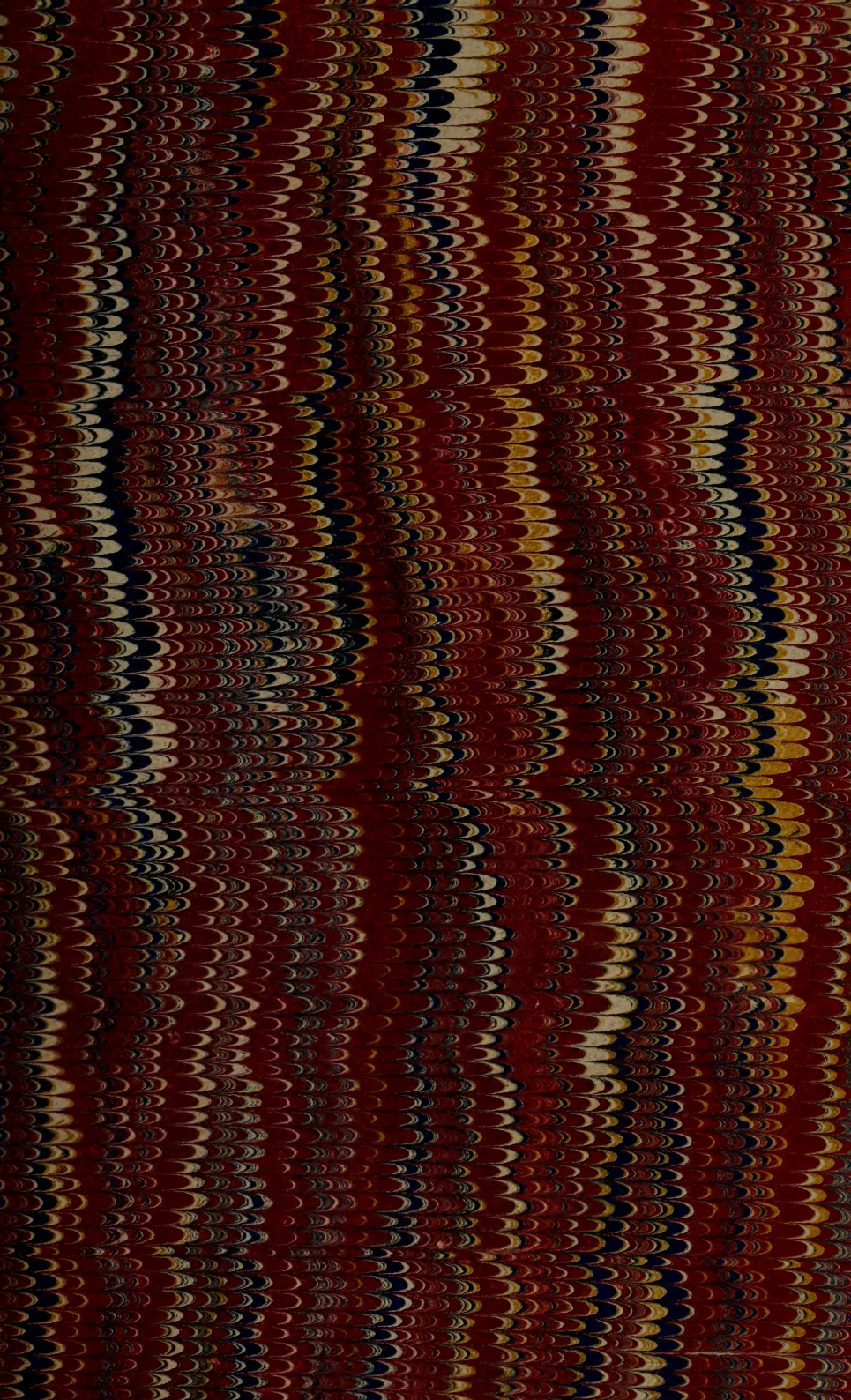
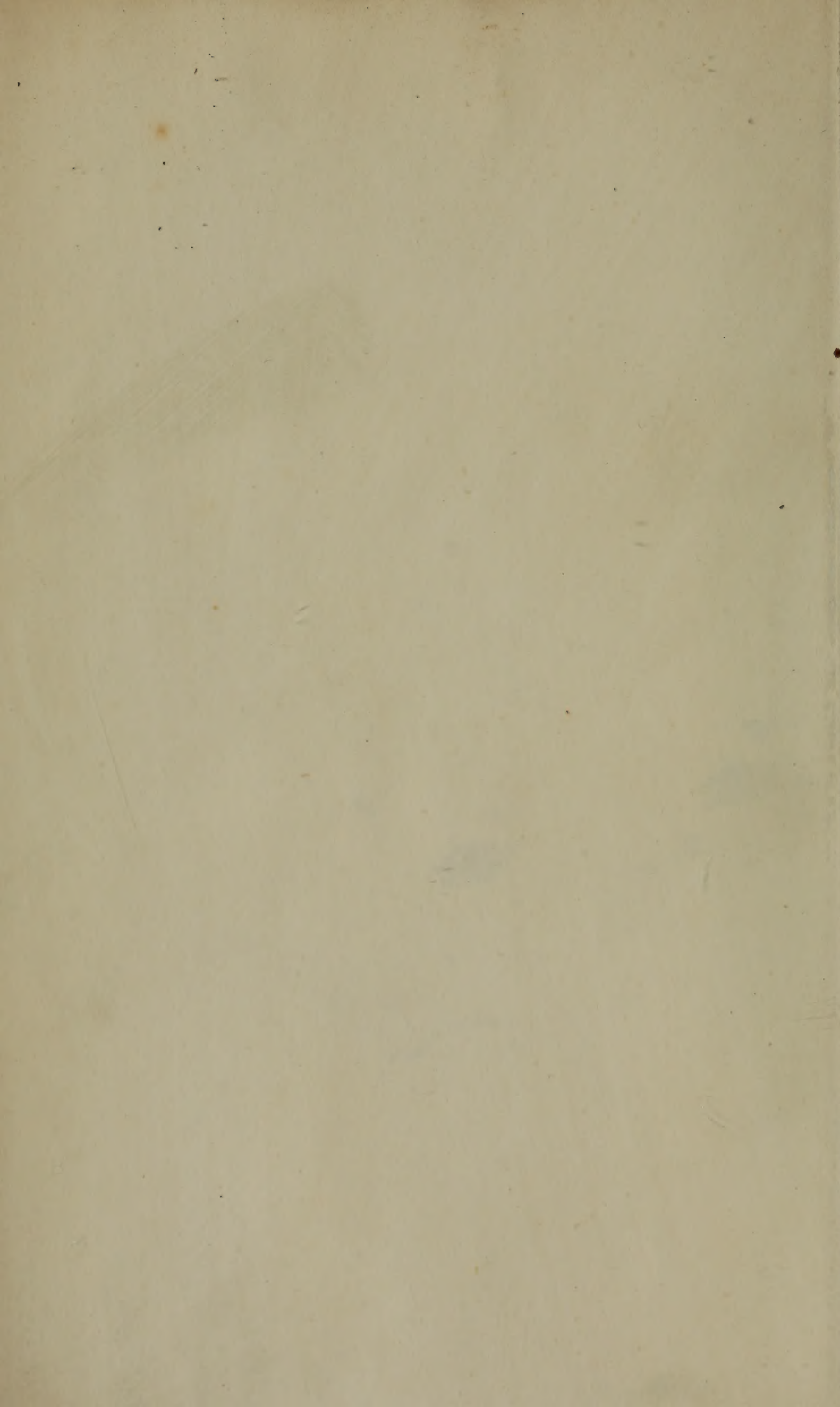


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THE ZOOLOGIST FOR 1846.

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THE
ZOOLOGIST:
A
POPULAR MISCELLANY
OF
NATURAL HISTORY.

CONDUCTED BY

EDWARD NEWMAN, F.L.S., Z.S., &c.

VOLUME THE FOURTH.



LONDON:
JOHN VAN VOORST, PATERNOSTER ROW.
M.DCCC.XLVI.

Nature, enchanting Nature, in whose form
And lineaments divine I trace a hand
That errs not, and find raptures still renew'd,
Is free to all men—universal prize.
Strange that so fair a creature should yet want
Admirers, and be destined to divide
With meaner objects ev'n the few she finds!—COWPER.



P R E F A C E .

I MAY truly say that the pleasure of addressing my subscribers, and giving as it were an account of the stewardship with which they have entrusted me, increases with each return of the season when this becomes a necessary task.

I have every reason to be satisfied with the progress the 'Zoologist' has made in every way. The circulation has continued to increase throughout the year, and the average monthly sale of 1846 has exceeded, by more than one hundred, the average monthly sale of 1845, and not only does the average number increase, but the ratio of increase is greater than at any previous time.

It is with great interest that I watch the success attending the 'Zoologist' in our large towns: in Manchester the sale has increased fourfold, in Bristol it has been doubled, and in Liverpool and Birmingham it has advanced, although not so rapidly: Manchester has long been famous for taking an honourable lead in support of every branch of the arts and sciences, and it is gratifying to observe her support of the 'Zoologist,' affording an additional proof of this highly meritorious spirit.

The sister publication, the 'Phytologist,' has long occupied the same ground in the Vegetable, as the 'Zoologist' in the Animal

Kingdom, and is well known to most of our readers. I have now the pleasing task of announcing a new candidate for favour, embracing the only department in Natural History which has hitherto been without its acknowledged organ of communication with the public; I allude to the 'London Geological Journal,' the first number of which has just issued from the press, and which for the value of its contents, and beauty of its illustrations, is unrivalled by any scientific periodical in existence. It was an idea of my own to separate the three branches of Natural History, and to assign its organ to each, under the names of 'Zoologist,' 'Phytologist,' and 'Geologist.' It rarely happens that the same individual cultivates with any zeal, more than one of these sciences; hence, the purchasers of either of the numerous magazines of Natural History paid two-thirds of their subscription exclusively for the benefit of others. This of itself is a reason why the various Natural History magazines have been unsuccessful, and of all those which commenced with a large share of public patronage, one only exists; and that one is largely occupied by translations of continental essays and reprints of the proceedings of Societies, the first of no present interest, and the last regularly supplied to us in a cheaper and more useful form.

The love of Zoology appears to be making considerable progress in this country. A more extended and a better taste exists than at any previous period. We are emerging from the dark age, when mere technicality passed for science, mere sophistry for philosophy. We now find an increasing taste for the living being, a decreasing taste for the dried fragments: we view the latter as valuable only in proportion as it informs us of the former. The pages of the 'Zoologist' afford the best possible illustration of these observations.

The Ray Society, projected three years ago, for the publication of "original works in Zoology, Botany," &c., &c., flags for want of works to publish. It has given to the subscribers a portion

of a work on Nudibranchiate Mollusca, which is highly creditable to the authors, Messrs. Alder and Hancock; also a translation of Steenstrup's clever, but somewhat hypothetical essay on the "Alternation of Generations." The other publications are valueless. A thick volume called "Reports on the progress of Zoology and Botany" is worse than valueless: it contains a variety of strictures on British Naturalists, written in the most objectionable spirit, and many of them totally unsupported by fact. A writer in the 'Annals and Magazine of Natural History,' says that these strictures were supplied from England, and, indeed they bear much internal evidence of this. If it be so, the transaction is alike discreditable to the writer, to Erichson who suffers his name to be printed as the author, and to the Ray Society, which gives such statements to the world.

The British Association met as usual; the only paper that appears of much zoological interest, was by Mr Blackwall, on the migratory birds in his own neighbourhood, and I regret to record, that this was objected to, as useless; there was also an anatomical paper by Professor Owen on the skull; a paper by Professor Allman on *Cristatella mucedo*; and several others on Mollusca and Radiata. Except, inasmuch, as this association affords the opportunity for social intercourse among men of science, and may thus give additional zest to the respective studies, I feel quite at a loss to imagine its utility. Whether science is served by their gastronomical doings seems problematical.

In *Quadrupeds*, a most remarkable discovery has lately been made in Ireland, by Messrs. Glennon and Nolan, of Dublin, the former of whom has kindly forwarded to me a MS. account of the particulars, and the latter has most obligingly communicated them by word of mouth, and allowed me to make a careful examination of the specimens. The facts are briefly these: the above-named gentlemen have discovered at Lough Gûr, a small lake, situated near Limerick, a vast quantity of bones, which ap-

pear to have been the rejectamenta of some slaughter-house: they consist principally of the skulls of cattle (*Bos*), of two or three species,—red deer, giant deer (*Cervus megaceros*), goats, and pigs of more than one species: and there also occur, but not in abundance, bones of the rein-deer. The skulls of the cattle, and some of the pigs, have large ragged fractures in the frontal bone, exactly similar to those which appear in the skulls of bullocks slaughtered at the present day with the pole-axe; and there seems no reasonable ground for doubting that the animals to which these skulls belonged also met their death from the hands of man, and by means of a very similar instrument. But the most remarkable circumstance is this—that among the skulls so fractured are two most unmistakeable specimens of female giant deer: to these my attention was particularly invited, and I have not the least hesitation in expressing my firm conviction that the fractures were the result of human hands, and were the cause of the death of the animals. These two fractured skulls correspond too exactly with each other, and with that of a bullock with which I compared them to have resulted from accident: the edges of the fractures wore an appearance of being coeval with the interment or submergence of the skulls, and presented a very strikingly different appearance from a fracture recently made, and which I had the opportunity of examining. There were several skulls of the male of the same species, one bearing enormous antlers, but none exhibiting the slightest trace of frontal fracture.

It is well known to palæontologists that remains of the giant deer have been discovered in Yorkshire, Lancashire, Norfolk, Essex, and I believe other English counties, and still more recently I hear of its having been discovered on the continent: there was also an accredited legend, that a skeleton now in the museum of the University of Edinburgh, was found in the Isle of Man; but it is now stated that a person named Crampton bought this in Dublin, carried it to the Isle of Man and sold it to the Duke of Athol, who presented it to the University. I am quite willing to leave this question in the hands of the disputants without expressing

an opinion of my own. Still the existence of the remains of this extraordinary quadruped beyond the limits of Ireland is thoroughly established; and from the evidence afforded by the formations in which they have been found, Professor Owen pronounces the giant deer to have been synchronous with the "Mammoth, rhinoceros, and other extinct Mammalia of the period of the formation of the newest tertiary freshwater fossiliferous strata," and he altogether repudiates the idea of its having been co-existent with man. Now we have only to refer to two of its congeners, the rein-deer and red deer,—both unquestionably fossil,—and I select them from a multitude of examples, to show that it is quite possible, indeed quite natural and probable, that the giant deer should have lived on until the human era commenced; aye, might still exist, were it not for the intervention of man himself! The absence of historical records, so long before the invention of printing, although so strenuously urged, would really amount to nothing: the same argument might be employed to show that the round towers of Ireland were equally pre-adamite with her deer: for neither Cæsar nor Tacitus throw any light on the *questio vexata* of their date and use: but we are not absolutely without records, for "Pepper in his 'History of Ireland' expressly states that the ancient Irish used to hunt a very large black deer, the milk of which they used, as we do that of the cow; the flesh of which served them for food and the skin for clothing."* And again, "Sir William Betham found some bronze or brass tablets, the inscription on which attested that the ancient Irish fed upon the flesh and milk of a great black deer."†

The position in which the remains of this animal are found, appear to me to be mistaken by Professor Owen: he takes great pains to show that in Ireland he "met with no person who had seen them in the peat itself. In every case," says the Professor, "where more definite information was afforded by an eye-witness of their discovery, it appeared that the antlers and bones had been dug

* 'Gigantic Irish Deer,' by H. D. Richardson, p. 25. † Id.

out of the lacustrine shell-marl beneath the peat or bog-earth." Now, I believe, from what I myself saw and heard in Ireland and what has lately been written by Mr. Richardson, that this is not quite a correct statement of the case: the bones occur in a recent deposit (called with what propriety I know not, "calcareous tuffa") which rarely contains shells, and never any other than recent species; which *always* overlies the marl and *sometimes* overlies the peat. To this it must be added that the bones are almost invariably found in apparently artificial excavations, and in close proximity to the so-called *raths* or Danish forts.

Add to these facts that "the marrow in some of the bones although changed into spermaceti [?] blazes like a candle,"* that "the cartilage and gelatine, so far from having been destroyed, were not apparently altered by time:"† that Archdeacon Maunsell actually made soup of the bones, and presented a portion thereof to the Royal Dublin Society: that the bones are *frequently* used for fuel: and that on the occasion of the rejoicings for the battle of Waterloo, a bonfire was made of these bones, and it was observed they gave out as good a blaze as those of horses, often used for such purposes:‡ and we shall surely find it very difficult to resist the evidence now adduced by Messrs. Glennon and Nolan, that these creatures not only existed in Ireland to an indefinite period after it was peopled by man, but that they were systematically, I might almost say, scientifically, slaughtered for his use.

At the first cursory glance, it may appear somewhat strange that the skulls of the males should invariably have been found entire, and that even the recent discovery at Lough Gûr should form no exception. I do not, however, find any difficulty here: in the first place we may fairly suppose that the males, like our bulls, were not equally prized as food: in the second place, the size, as well as the position of the antlers, would render it next to an impossibility to give the desired blow with the poleaxe: in the third place, the greater

* 'Fossil Deer of Ireland,' by John Hart, Dublin, 1825, p. 8.

† 'Reports of Analysis,' by James Apjohn. ‡ Hart.

strength and thickness of the skull would almost to a certainty render the blow unavailing : and in the fourth place, supposing the females domesticated, and the occasional tenants of sheds and other buildings, we may well imagine that the males were excluded from such buildings by the enormous size of their antlers. Perhaps a few only of the males, as in our cattle, were suffered to become adult, one male sufficing for many females. Perhaps the males were allowed free range, the females only being permitted at stated seasons to accompany them. In fine, the more we investigate probabilities, the more we reason from present experience and knowledge, the less difficulty shall we find in the way of believing the gigantic deer of Ireland, an animal coeval with man and subservient to his uses.

I beg to invite particular attention to M. Deby's papers (Zool. 1462 and 1528) on *Whales*. They are admirably written, and display a very unusual knowledge of the most obscure order of vertebrate animals.

In records of new *Birds*, the present volume is unusually rich : the Spotted Eagle (*Aquila nœvia*), is reported by Mr. Davis as having occurred in Ireland (Zool. 1207) ; but I regret to add that subsequent records on the same subject must be received with caution : Mr. Fisher, who has lately visited the west of Ireland, is persuaded that no third species of eagle occurs in any abundance ; the record of this bird as British, must therefore be limited to two examples, one of which escaped, and the other is preserved in the Museum at Dublin. The Great Belted Kingfisher (*Alcedo alcyon*) has occurred twice in Ireland as reported by Mr. Ball (Zool. 1212) : other specimens have been offered for sale as Irish, but must be regarded with doubt. The Australian Spine-tailed Swallow (*Acanthylis caudacuta*) has been killed in Essex, as reported by Mr. Catchpool (Zool. 1492). The Red-billed Whidah-bird (*Emberiza vidua*) and Crimson Weaver-bird (*Euplectes ignicolor*) are reported from the coast of Kent by Dr. Plomley (Zool. 1497 and 1499).

Lastly, the Black Swan (*Cygnus atratus*) has been killed in Scotland (Zool. 1501). Although my own opinion may perhaps differ from that of some of my subscribers, I may be pardoned in expressing my opinion that the Spotted Eagle should be regarded as a real addition to the list of British Birds; the Belted Kingfisher and Spine-tailed Swallow as voluntary visitors: and the Whidah-bird, Weaver-bird, and Swan as probably stragglers from aviaries or ponds. Another new Swallow was mentioned in the concluding number for the year (Zool. 1550). This bird is probably a variety of the common house-martin, differing materially in wanting the usual white markings, and also as Mr. Yarrell has pointed out to me, in the greater length of its wings, which exceeds by the eighth of an inch any adult specimen which that gentleman possesses.

The nest and eggs of Savi's Warbler (*Salicaria luscinioides*) are first described in the present volume by Mr. Bond (Zool. 1212).

The paper on the Birds of Norfolk, by Messrs. J. H. Gurney and W. R. Fisher (Zool. 1300, &c.) is one, which I am compelled to notice as everything that can be desired: equal care is exhibited throughout, in discarding the erroneous and doubtful, and in ascertaining and preserving all that is true.

Two *Fishes*, new to Britain, are described; the Six-branchial or Gray Shark (*Notidanus griseus*), by Mr. Couch (Zool. 1337), and the Long-finned Tunny (*Orcynus alà longâ*), by Mr. R. Q. Couch (Zool. 1413). The last-named gentleman has also contributed the most valuable and interesting record of the habits of fishes (Zool. 1400, &c.) that has ever been published. The accuracy and sterling worth of the remarks of these two gentlemen cannot be estimated too highly; they tend to the great desideratum of making us familiar with the inhabitants of the sea, that treasury of nature which circumstances tend to seal hermetically against the majority of her votaries.

The past summer has been remarkably prolific in rare British *Insects*, especially among the Sphingidæ, and the 'Zoologist' being

the legitimate organ for recording such captures, has of course abounded in such records. Our rarest butterfly, *Vanessa Antiopa*, has also appeared generally, although not abundantly, in most of the English counties. *Argynnis Lathonia* has been taken in the south-eastern counties. *Lithosia pulchella* has been captured at Epping, *Catocala Fraxini* near Manchester, *Cynæda dentalis* near Lewes, and other extraordinary captures have been made, but perhaps, the most remarkable, is the occurrence of *Orthosia subrosea* in considerable abundance at Whittlesea Mere (Zool. 1515); this insect has long been considered questionable as British, and an author of high reputation has even been pronouncing it, an exclusively North American form. The Locust has appeared plentifully; the newspapers say in "vast swarms," but the accounts I have received do not warrant the use of such a term: two or three only having been found together. Mr. Frederick Smith has described several new British Bees (Zool. 1274, 1445, 1556), and the Rev. G. T. Rudd, a new species of *Haltica* (Zool. 1517). Notwithstanding the extraordinary heat and fineness of the season, the two British species of *Colias* have not appeared in their accustomed localities in the London district, nor I believe, throughout the kingdom, a fact worthy of record, as showing that their occurrence does not depend on warmth, but must be sought in other causes.

On the subject of contributions I wish to say a few words. I find that several contributors have felt themselves aggrieved by the non-publication of lists of the names of *Lepidoptera* with which they have favored me: now perhaps these are not aware that the printing of all the lists I receive would not only exclude all other information from the pages of the 'Zoologist,' but would increase the monthly numbers to double their present size. Such lists also become tedious from the multiplicity of repetitions: there are a vast number of species of British *Lepidoptera*, of which the absence would be more remarkable than the presence. And I beg contributors to bear in mind, that I have, on several occasions, stated very clearly the only conditions on which lists can be published.

Species of general occurrence must be entirely omitted; generic and specific names must be written in full, and intelligibly, so that there shall be no necessity for my transcribing the MSS.; dates and exact localities must be given, and the mode of capture specified. On subjects generally, I hope my contributors will write their communications as they are desired to appear, giving each its proper designation, and writing nothing on the back; when a number of matters are related in a closely written or crossed letter, the permission to extract what I please is often unavailing, and the letter is laid by for an indefinite period, in the fruitless expectation that I shall some day have leisure to make the desired quotations. With regard to not answering letters, I must claim some indulgence; to answer with my own hand all I receive, is physically impossible, even though I gave up all other occupation: those correspondents, therefore, who have not received answers, must kindly attribute the seeming neglect to its true cause.

In conclusion, I beg again to offer my best thanks both to contributors and subscribers, more especially to those who have laboured so successfully in advocating the cause, promoting the sale, and augmenting the utility, and consequent popularity of the 'Zoologist.'

EDWARD NEWMAN.

9, Devonshire Street, Bishopsgate,
December, 1846.

CONTENTS.

ALPHABETICAL LIST OF CONTRIBUTORS.

- ATKINSON, REV. J. C., B.A.**
 Submergence of the moorhen, 1325 ;
 Ventriloquism in birds, 1371 ; Further remarks on the submergence of water-birds, 1395
- BACKHOUSE, W.**
 Additions to Mr. Hogg's Catalogue of Durham birds, 1261
- BARCLAY, J. GURNEY**
 Occurrence of *Sphinx Convolvuli* at Layton, 1512
- BAKER, W.**
 Cattle moulting bones, 1366
- BANISTER, REV. J. D., M.A.**
 Remarks on the piscatory habits of the polecat, 1244
- BARLOW, T. W.**
 Cattle moulting bones, 1206 ; Note on the pheasant, 1500 ; Occurrence of the gray goose and Cornish chough near Holmes Chapel, 1501 ; Note on some of the birds mentioned in Shakspeare's plays, 1539 ; Remarks on the migratory birds in the vicinity of Holmes Chapel, 1547
- BARTLETT, J. PEMBERTON**
 Carnivorous propensity of the hedgehog, 1204 ; Is the black rat strictly a native of Great Britain, or was it like the brown rat, introduced into Europe from Asia ? 1294 ; Extraordinary migration of butterflies, 1442
- BATES, H. WALTER**
 Distribution of the species of *Harpalus* and *Ophonus*, 1206
- BELL, ROBERT JOHN**
 Occurrence of the white-winged cross-bill at Derby, 1247 ; Of Steller's western duck at Filby, 1249 ; Memorandum of the spawning of trout, 1264
- BENINGTON ARTHUR**
 Death's-head hawk-moth at sea, 1443 ; Early arrival of the chiff-chaff at Swansea, 1496
- BIRCH, W.**
 Occurrence of the hooded crow near Stourbridge, 1550
- BLADON JAMES**
 Remarkable instance of tenacity of life, 1357 ; On the duration of *Hymenoptera* in the larva state more than one season, 1458 ; Occurrence of the tern at Pont-y-pool, 1555 ; Large sturgeon in the Usk, 1555
- BOLD, THOMAS JOHN**
 Occurrence of Richard's pipit near Newcastle, 1210 ; Carnivorous propensity of the common black slug, 1216 ; Capture of *Coleoptera* in the North of England, 1237 ; Food of slugs, 1503 ; Capture of the larvæ of *Acherontia Atropos* near Morpeth, 1508 ; Occurrence of the locust in the North of England, 1520
- BOND, FREDERICK**
 Flowers attractive to moths, 1341 ; Occurrence of *Sphinx Convolvuli* near Kingsbury, 1510 ; Occurrence of the locust near Kingsbury, 1518 ; at Duxford and Fulborne, 1521
- BORRER, WILLIAM JUN., F.L.S.**
 Notice of the occurrence of the Virginian colin in Surrey, and of the broad-billed sandpiper, and red-necked phalarope in Sussex, 1394
- BRAMLEY, J.**
 Occurrence of *D. Livornica* in London, 1514
- BREE, C. R., F.L.S.**
 The nightingale in Monmouthshire, 1211 ; Carnivorous propensity of the dragon-fly, 1240 ; Occurrence of the grosbeak at Stowmarket, 1247 ;

- Dates of arrival of summer visitors at Stowmarket, 1548
- BRIGGS, JOHN JOSEPH**
On the varieties of the common fox, 1203; Partial migration, 1470; Birds at sea, 1502
- BROMFIELD, WILLIAM ARNOLD, M.D., F.L.S.**
Appearance of *Colias Edusa* in the Isle of Wight, 1441; Capture of Lepidoptera in the Isle of Wight, 1444
- BROWN, EDWIN**
Gordius aquaticus supposed to fall from the atmosphere with rain, 1220; Proposed mode of recording the appearance of Lepidoptera, 1224; Exhibition of strength in the larva of one of the Staphylinites, 1238
- BROWN, T.**
Occurrence of the larvæ of *Acherontia Atropos* near Cambridge, 1508; Occurrence of *S. Convolvuli* at Cambridge, 1509
- BULL, HENRY**
Hops and Hop-flies, 1521
- BURTON, GEORGE JUN.**
Occurrence of *Acherontia Atropos* near Hesse-upon-Humber, 1508; Occurrence of *Sphinx Convolvuli* near Hesse-upon-Humber, 1511
- CATCHPOOL, THOMAS JUN.**
Singular habit of the swift, 1499
- CHENNEL, F. A.**
Occurrence of the oyster-catcher inland, and incubation of the ring-plover, 1212; Eggs of the flesh-fly deposited in a living toad, 1215
- CLEAR, WILLIAM**
Treatment of insects when captured, 1437; Occurrence of *Deilephila Livornica* near Cork, 1444
- CLIBBORN, BARCLAY**
Ornithological Note, 1368
- CLIBBORN, JAMES**
Curious nesting-place of a pair of robins, 1368
- COOK, NICHOLAS**
Kestrel preying upon a rat, 1550
- COOK, ROBERT**
Occurrence of *Vanessa Antiopa* near York, 1504; Occurrence of *Sphinx Convolvuli* near York, 1510; Occurrence of the locust near York, 1519
- COOPER, JAMES**
Occurrence of the American bittern near Fleetwood, 1248; Occurrence of the white-winged crossbill near Carlisle, 1551; Occurrence of the gray phalarope near Preston, 1552; On the noise made by the snipe, 1553
- COUCH, JONATHAN, F.L.S.**
Some account of *Gonoplax Rhomboides*, 1217; Capture of the gray shark in Cornwall, 1337
- COUCH, R. Q., M.R.C.S.**
Notes on the fishes of the Land's End, 1400
- DANIEL, HENRY**
The oil-gland, 1250; The Oil-gland again, 1393; Effect of captivity on the appetite of birds, 1502
- DAVIS, ROBERT JUN.**
Carnivorous propensity of the hedgehog, 1293; Occurrence of *Sabine's* snipe near Clonmel, 1500; Occurrence of the larvæ of *Acherontia Atropos* at Clonmel, 1508; Occurrence of *S. Convolvuli* at Clonmel and Dunmore, 1509
- DAWSON, REV. JOHN F., M.A.**
Capture of rare moths near Lyndhurst, in the New Forest, 1230; Occurrence of *Haltica consobrina* in the Isle of Wight, 1239; Treatment of Coleoptera when captured, 1240; Habits of *Melitæa cinxia*, 1271; Comparative dates of the occurrence of some species of Coleoptera near Ventnor, 1359; Occurrence of *Vanessa Antiopa* in the Isle of Wight and near Leatherhead, 1506
- DAWSON, JOHN**
Swallows never seen at the Carron Iron Works in winter, 1297
- DEBY, JULIAN**
Notes on the birds of Belgium, 1251; On some whales stranded on the Belgian coast, 1462—1528
- DOUBLEDAY, HENRY**
Occurrence of *V. Antiopa* near Epping, 1504; Observations on *Acherontia Atropos*, 1507; Occurrence of *S. Convolvuli* near Epping, 1509; Capture of *Lithosia pulchella* near Epping 1515; Occurrence of *Graphiphora subrosea* at Whittlesea Mere, 1515; Occurrence of the locust near Epping, 1519
- DOUGLAS, J. W.**
Capture of Lepidoptera, 1223; Descriptions of ten new British moths, 1266; On killing and relaxing insects, 1343; Occurrence of *V. Antiopa* at Mickleham, 1536

- EDLESTON, ROBERT S.**
Capture of Lepidoptera near Manchester, 1220; Remarks on the occurrence of *Lasiocampa Trifolii* near Manchester, 1226; Capture of *Deilephila Celerio* at Manchester, 1346; Habitat of *Gortyna petasitides*, 1347; Capture of *Catocala Fraxini* at Manchester, 1515
- ENGLEHEART, N. B.**
Occurrence of *Sphinx Convolvuli* at Blackheath, 1511
- EVANS, A. L.**
Description of the larva of *Orthosia opima*, 1227
- EVANS, JOHN**
A quail shot in Worcestershire in January, 1299
- EVANS, W. F.**
Occurrence of *V. Antiopa* near Lincoln, 1505, and in the Isle of Wight, 1506; Occurrence of the locust in Glamorganshire, 1521
- FITT, GEORGE**
Occurrence of *S. Convolvuli* near Yarmouth, 1512; Occurrence of the locust near Yarmouth, 1520
- FISHER, W. R., F.L.S.**
Note on the sound produced by the common snipe, 1501
- FOSTER, ERASMUS R.**
Is the tumbling of pigeons a natural or acquired habit? 1500
- FOX, EDWIN**
Occurrence of *Vanessa Antiopa* at Tottenham and Streatham, 1506
- FOX, GEORGE**
Blackbirds hatched by a canary, 1210
- FRERE, REV. H. T., M.A.**
On the varieties of the common dog, 1201; Polecat preying upon eels, 1204; Occurrence of *Anthus arvensis* in February, 1210; Anecdote of herons fighting, 1212; Singular mode of catching eels, 1216; Remarks on the tracheæ of wild geese, 1249; Norfolk swan fattening, 1250; Further remarks on the habits of the eel, 1264; Occurrence of the tadpole fish off Sherringham, 1264; On the rusty tinge of the plumage of wild swans, 1300; Occurrence of *S. Convolvuli* at Aylsham, 1511
- GARTH, JAMES C.**
Occurrence of the crossbill near Knaresborough, 1367; Occurrence of the great black woodpecker near Knaresborough, 1298; Occurrence of the locust near Knaresborough, 1518
- GAZE, WILLIAM**
Occurrence of *S. Convolvuli* at Sudbury, 1510
- GIBSON, G. STACEY**
Occurrence of *V. Antiopa* at Saffron Walden, 1507
- GOATLEY, T.**
Death's-head hawk-moth at Burton-on-the-Heath, 1443; at Chipping Norton, 1508; Occurrence of *S. Convolvuli* at Chipping Norton, 1512
- GOODACRE, F. B.**
Description of the American variety of the common wolf, 1526
- GORDON, REV. G., M.A.**
Occurrence of the locust in Scotland, 1521
- GOSSE, P. H.**
Notice of a species of *Delphinorhynchus*, 1527
- GREENWOOD, ALFRED**
Cattle moulting bones, 1206; Occurrence of *Acherontia Atropos* at Chelmsford, 1507; Occurrence of *Sphinx Convolvuli* at Hythe and Chelmsford, 1513; Occurrence of *Deilephila Celerio* near Great Bad-dow, 1514; Occurrence of the locust near Chelmsford, 1520
- GURNEY, J. H.**
Occurrence of the red-necked phalarope in Norfolk, 1552; Occurrence of the Spanish sea-bream at Sherringham, 1555
- GURNEY, J. H. and FISHER, W. R.**
An account of birds found in Norfolk, 1300, 1373
- GUYNON, GEORGE**
The father-lasher's capability of living in fresh water, 1215; Occurrence of *Aëpus fulvescens* near Ventnor, Isle of Wight, 1357; Deviation from the usual formula of stræ in *Abax*, 1357; Discrepancy between the two antennæ of a *Dytiscus*, 1518; Feeling of insects, 1526
- HALL, THOMAS**
Occurrence of the great horned owl at Hampstead, 1496; Longevity of the oyster-catcher, 1501; Stormy petrel in London in 1824, 1502; Occurrence of *S. Convolvuli* in the City Road, London, 1510; Occurrence of the locust near London, 1519
- HALIDAY, A. H.**
To expel mites from cabinets of insects and to exclude them, 1524
- HAMBROUGH, W.**
Pterophorus tridactylus captured on the 25th of February, 1348

- HARDING, H. J.**
 Capture of *Peroneæ* at Hainault Forest, 1228, 1516; Observation on the occurrence of *Acherontia Atropos*, 1507; Occurrence of *Sphinx Convolvuli* at Hackney, 1512; Capture of *Trochilium Allantiforme* at Greenhithe, 1515; Capture of *Catocala sponsa* at Darenth Wood, 1515; Occurrence of the locust near London, 1520
- HARDY, JAMES**
 Occurrence of *Trypodendron domesticum* in the vicinity of Newcastle-upon-Tyne, 1357; Rat fishing for eels, 1364
- HARRISON, REV. H. R., M.A.**
 Increase and decrease in the weight of a hive of bees, 1355
- HARVEY, J. R., M.D.**
 Occurrence of the white stork near Fermoy, and note on the herring-gull breeding in confinement, 1394
- HAWLEY, JOHN R.**
 Larva of *Acronycta Alni*, 1228; List of *Orthosiæ* occurring near Doncaster, 1353
- HEPBURN, ARCHIBALD**
 Note on the partial migration of certain birds in East Lothian, and a few remarks on the subject in general, 1332
- HINDLEY, WILLIAM**
 Occurrence of *V. Antiopa* at Limehouse, 1506; Occurrence of *Peroneæ* in Hainault Forest, 1516
- HORNE, C.**
 Curious mode of fishing in India, 1340; Exploding property of *Pausidæ*, 1357; Singular use for a *Buprestis* at Madras, 1357
- HORNE, GEORGE**
 Curious capture of a goshawk, 1496
- HORSLEY, C. H.**
 Miscellaneous facts in the Natural History of New South Wales, 1422
- HORSLEY, REV. F. W., M.A.**
 Occurrence of *Sphinx Convolvuli* near Faversham, 1513; Occurrence of *D. Galii* near Faversham, 1514
- HOUGH, JOHN**
 Revival of a frozen frog, 1215
- HUGHES, G. J. R.**
 Habits of the raven, 1366; The peculiarity in the mode of a robin capturing its prey, 1393; On destroying bees, 1459
- HUNTER, C. B.**
 Nesting of Montagu's harrier in Norfolk, 1496; of the lesser redpoll in Norfolk, 1497; Occurrence of the white-winged crossbill near Thetford, 1498; Occurrence of the little auk near Downham in Norfolk, 1502
- HUSSEY, REV. ARTHUR, M.A.**
 On the treatment of insects when captured, 1344
- HUTCHINSON, MATTHEW**
 Note on the arrival of some of the summer birds of passage at Shooters Hill, Kent, in the spring of 1845, 1295
- KELAART, E. F., M.D., F.L.S.**
 Note on the Gibraltar or Barbary ape, 1293
- KING, JOHN**
 A lady bit by an adder, 1263
- KING, ROBERT L.**
 Singing of swans, 1214; *Psidium pusillum* attracted by the skull of a fox, 1266; *Mollusca* found in Cornwall, 1420; Cornish reptiles, 1503
- LAMBERT, ALFRED**
 Remarkable habits of an Australian spider, 1219; Australian caterpillar and parasite, 1226
- LAMEK, A.**
 List of *Papilionidæ* occurring at Wansbeck near Hamburg, 1432; On the length of time taken by *Sphinx Ligustri* in the change from the larva to the pupa state, 1346; Admirable sagacity of a fox in preying upon game, 1365; Occurrence of *Sphinx Nerii* near Hamburg, 1514
- LAWSON, GEORGE**
 Domestication of wood-pigeon, 1248; Cattle moulting bones, 1295; Anecdote of a sparrow, 1298
- LEVETT, FRANCES M.**
 Male glowworm luminous, 1459
- LEWIS, GEORGE**
 Habits of the goldfinch and canary, 1367
- LEWIS, REV. W. S., M.A.**
 Anecdote of a crab, 1265
- LINGWOOD, ROBERT M.**
 Brambling near Ross, and anecdote of a robin, 1211
- LOGAN, R. F.**
 Anecdote of a robin, 1211; Flowers attractive to moths, 1225; Larvæ of *Odontopera bidentata*, 1228; *Graphiphora renigera*, 1273; Larva of *Graphiphora cataleuca*, 1347

LONGLEY, HENRY

Pseudotomia atromargana and *strobilella*, 1228; Occurrence of the locust in Pegwell Bay, 1521

MACGILLIVRAY, JOHN

An account of Raines' Islet on the N.E. coast of New Holland, 1473; Ornithological excursion to the north coast of New Holland, 1481; Notes on Australian Natural History, 1485; Nidification of some Australian birds, 1546

MARSH, REV. WILLIAM, M.A.

Winter appearance of *Vanessa Urticæ*, 1273

MORRIS, BEVERLEY R., B.A., M.D.

Spawning of trout, 1215; On the periodic appearance of *Colias Eudusa* at Charmouth, Dorset, 1442; Northern range of the nightingale, 1298; Effect of the mild weather, 1298

MORRIS, REV. FRANCIS ORPEN, B.A.

Curious deviation from the ordinary habits of the kingfisher, 1551; Extraordinary feet in a duck, 1214; The wasp insectivorous, 1233; Occurrence of *Sphinx Convolvuli* in Yorkshire, 1511; Occurrence of the white stork near Driffield, Yorkshire, 1501

MOSLEY, SIR OSWALD, BART., F.L.S.

Occurrence of the great ash-coloured shrike, and snow bunting near Burton-on-Trent, 1209; Remarks on the nuthatch, 1498

MONTFORD, E. G.

Ferocity of the blue-headed titmouse, 1367

MUNFORD, REV. GEORGE, M.A.

Insects feeding upon mineral substances, 1230

MURCH, EDWARD

Song of the fieldfare, 1297; Occurrence of the nightingale in Devonshire, 1393; Occurrence of the gray phalarope near Honiton, 1552

MUSKETT, CHARLES

Effects of music upon animals, 1295; Occurrence of *Argynnis Lathonia* near Norwich, 1505; of *Vanessa Antiopa* near Norwich, 1507; Capture of *Acherontia Atropos* in Norfolk, 1507; Occurrence of *Sphinx Convolvuli* near Norwich, 1509; of *Notoxus monoceros* near Norwich, 1517; of the locust in Norfolk, 1521

NEWMAN, HENRY

Eggs found in a tortoise, 1399

NEWMAN, BEVINGTON

Occurrence of the locust on Peckham Rye, 1518

NEWMAN, EDWARD, F.L.S.

Description of the spotted eagle, 1207; Occurrence of the great belted kingfisher in Ireland, 1212; Nest and eggs of Savi's warbler, 1212; Economy of *Melœ*, 1241; New work on British *Desmidae*, 1243; Description of *Perga scabra*, 1274; The apes at Gibraltar, 1292; On the occurrence of the Australian spine-tailed swallow in England, 1492; Feeling of insects, 1525

NEWTON, ALFRED

Notes on the chaffinch, quail, and ringdove, &c.; on redpolls staying at Thetford through the summer, 1497; Dates of arrival of migratory birds in Norfolk, Suffolk, and Cambridgeshire, 1549

NORMAN, G. W.

Rooks building upon house-tops, 1366; Occurrence of *S. Convolvuli* and *Acherontia Atropos* near Hull, 1513

NOYE, WILLIAM

Occurrence of *Lasiocampa Trifolii* near the Land's End, 1226; Capture of *Acherontia Atropos* at the Land's End, 1345, 1507; Occurrence of *Sphinx Convolvuli* near the Land's End, 1513; of *Deilephila Livornica* near the Land's End, 1514; of *Lasiocampa Trifolii* near the Land's End, 1515; of the locust in Cornwall, 1519

PLANT, JOHN

Occurrence of *V. Antiopa* near Leicester, 1506; of *Acherontia Atropos* near Leicester, 1508; of *Sphinx Convolvuli* near Leicester, 1511; of *Deilephila Celerio* near Leicester, 1514; of the locust near Leicester, 1519

PRENTICE, CHARLES

Occurrence of *Platyrhinus latirostris* near Cheltenham, 1517

PLOMLEY, F., M.D.

Frequent occurrence of the white wagtail in Kent, 1497; Occurrence of the red-billed whidah bird in Kent, 1497; of the crimson weaver bird in Kent, 1499; of the Egyptian goose in Kent, 1501

RANSOM, R. C.

Capture of *V. Antiopa* at Ipswich, 1506

REECE, GEORGE

Singular variety of the wheatear, 1496; Occurrence of the locust near Worcester, 1519; of wild geese, &c. at Worcester, 1555

REEVES, WALTER R.

Occurrence of *Sphinx Convolvuli* near Tonbridge Wells, 1510

RICHARDSON, FRANCIS

Cockatoo's laying eggs in confinement, 1210; Anecdote of a thrush, 1210; Migration of the swallow, 1211; Carnivorous propensity of the common slug, 1216

RODD, EDWARD HEARLE

Late stay of the swallow at Penzance, 1247; Occurrence of the bearded titmouse, 1298; of the purple heron near Penzance, 1331; Early arrival of the swallow in Cornwall, 1368; Occurrence of the crested lark near Penzance, 1497; of the buff-breasted sandpiper at Penzance, 1500; of the gray phalarope near Penzance 1552; of *Tringa Schinzii* near Penzance, 1554

ROGERS, JOHN T.

Occurrence of *Vanessa Antiopa* near Winchester, 1504

ROSS, W. F. L.

Snipe in captivity, 1331; Remarks on a tortoise, 1336; Power of instinct in the male oak-egger moth, 1346

RUDD, REV. G. T., M.A.

Capture of *Macrocnema marcida* on *Cakile maritima*, 1516; Description of a new *Haltica*, 1517

RUDD, T. S.

Late departure of the swallow at Redcar, 1368; Occurrence of *Sphinx Convolvuli* near Redcar, 1512; Occurrence of the locust near Redcar, 1520

SLATER, P. L.

Early appearance of the tufted duck, 1214; Occurrence of Sabine's snipe in Hampshire, 1300

SHEPPARD, W.

Treatment of insects when captured, 1438

SHEPHERD, HENRY

Capture of *S. Convolvuli* near Winchester, 1510

SIRCOM, JOHN, JUN.

Anecdote of a cow pumping water, 1206; Occurrence of *Acherontia Atropos* near Bristol, 1507; of *S. Convolvuli* at Bristol, 1512

SLATER, J. W.

Carnivorous propensity of the hedgehog, 1245; Sensibility of insects, 1437; Weasels hunting in packs, 1462

SLADEN, REV. EDWARD H. M., M.A.

Arrival &c. of birds at Warnford in 1846, 1547

SLANEY, W. H.

Quail and landrail shot in January, 1846, 1299; Note on the water-rail, 1299; Further notes on the moorhen, 1369

SMITH, FREDERICK

Description of the British species of bees comprised in the genera *Colletes* of Latrielle and *Macropis* of Klug, 1274; Description of British bees, 1445; Supplementary paper on a few species of bees recently discovered, 1566

SMITH, JOHN

Note on the early breeding of the bearded tit, 1497

SMITH, HENRY ECROYD

Late stay of the house-martin at Alton, 1247

SPICER, J. W. G.

Egg laid by a tortoise, 1399

STAINTON, H. T.

Capture of *Lepidoptera* at Lewisham, 1229; on the Downs near Godstone Road, 1229; in Scotland, 1229, 1354; near Ambleside, 1439; at Keswick, 1440; near Kilmun, 1440; of *Hadena rectilinea*, 1444

STANLEY, H.

Cattle moughing bones, 1246

STEPHENS, HENRY OXLEY

Cattle moughing bones, 1365

STEPHENS, JAMES FRANCIS F.L.S., Z.S.

Occurrence of *V. Antiopa* near Woburn, 1506; of *S. Convolvuli* at Camberwell and Faversham, 1509; of *Deilephila Livornica* near Lewes, 1514; of the locust near Camberwell, 1519, and near Richmond, 1519

STEVENS, SAMUEL

On an admirable method of relaxing insects, 1343; *Endromis versicolor*, 1344; Capture of *Deilephila lineata* near Hammersmith, 1345, 1346; of *Orthosia leucographa*, 1347; Note on *Graphiphora tristigma*, 1347; Capture of *Clæora* or *Ephyra pictaria*, 1347; *Miana strigilis* and *Æthiops*, 1348; Capture of *Lepidoptera* at Hammer-

- smith, 1348; at Arundel, Sussex, 1350; at Black Park, Bucks, 1352; of *Vanessa Antiopa* at Kensington, 1506; Capture of the locust at Hammersmith, 1521; Blackberries attractive to moths, 1524
- STREATFIELD, J. F.
Note on miscoloured eggs, 1393; Note on cuckoos, 1394
- TAYLOR, ISAAC, JUN.
Cattle mouching bones, 1206; *Convolvulus* hawkmoth at Stanford Rivers, Essex, 1444; Capture of *Emmelesia Blomeri* at Chenies, 1516
- THOMPSON, HENRY
On the occurrence of parti-coloured song thrushes, 1496
- THOMPSON, W., JUN.
Occurrence of *Cynæda dentalis* at Lewes, 1516
- THRUPP, G. A.
Remarkable habit of the rook, 1210; *Acronycta Alni*, 1226
- TURNER, REV. WILLIAM, M.A.
Acidalia aversata and *A. remutata* varieties of one species, 1227; Varieties of *Miselia Oxyacanthæ*, 1227; On the treatment of insects when captured, 1342; Occurrence of *S. Convolvuli* near Uppingham, 1512; of the locust near Uppingham, 1520; Feeling of insects, 1524; White starling and curious facts respecting starling's eggs, 1550; Occurrence of a swallow new to Britain at Uppingham, 1550; Anecdote of confidence in a swallow, 1551
- WALCOTT, W. H. L.
Note on the capture of a hermaphrodite specimen of *Anthophora retusa*, 1282; On the use of moisture in collecting Coleoptera, 1282; Note on queen bees, 1355
- WALKER, FRANCIS F.L.S., G.S., Z.S.
Additional note on *Tetrastichus*, 1232; Parasitism of Chalcidites, 1233; Economy of *Selandria Cerasi*, 1234; Note on a species of *Platygaster*, 1235; Note on *Pteromalus puparum*, 1235; Note on the species of *Haltica*, 1239; Oak-apples of America, 1281; Notes on Aphides, with reference to the plants on which they feed, 1288; *Empis borealis*, 1354; *Callimome versicolor*, 1356; Aphis of the apple, 1359; Rhodites of the rose-gall, 1359; List of insects inhabiting oak-apples, 1454; Notes on oak-galls, 1457; Description of *Eulophus Agathyllus*, 1458; American blight, 1460; Note on the Aphis of the hop or hop-fly, 1461
- WEAVER, RICHARD
The spotted or silver-eagle, 1246; *Psychophora trepidaria*, 1274; Capture of Lepidoptera in Scotland, 1439; of *Lamia ædilis* in the Black Forest, Rannock, 1460; of *Trichius fasciatus* near Rannock, 1460; of *Deilephila Celerio* at Birmingham, 1515
- WEBSTER, THOMAS
Immense swarm of gnats, 1444
- WEIR, P. JENNER
Notes on the capture of Lepidoptera in the vicinity of Lewes, 1440; of *Argynnis Lathonia* near Dovor, 1505; of *Deilephila Celerio* at Lewes, 1515; of the locust near Camberwell, 1519
- WHITE, ADAM
Occurrence of the locust in Hyde Park, 1518
- WILD, W. J.
Capture of *Vanessa Antiopa* at Camberwell, 1505
- WING, W.
Occurrence of *Agrotis Saucia* at Hammersmith, 1515
- WINTER, J. N.
Capture of *Apatura Iris* at Poynings, 1505
- WOOD, C.
Occurrence of *Sphinx Convolvuli* and *Acherontia Atropos* at Tooting, 1513
- WOLLASTON, T. VERNON, B.A., F.C.P.S.
Irish locality for *Amphipeplea involuta*, 1216; Occurrence of *Melolontha Hippocastani* in Ireland, 1238; Battle between a dragon-fly and wasp, 1242; Note on the variation of insects found on the coast, 1283; Note on the Coleoptera of South Wales, 1284; Note on *Cygnus atratus*, 1327; Do insects feel or do they not? 1434; Note on the habits of *Macrocnema marcidula*, 1459; Capture of *Nebrida livida* near Bridlington, 1517; of *Tapiotus sellatus*, 1517; Occurrence of the locust in Yorkshire and Devonshire, 1518; Observation on insect sensibility, 1550
- WOLLEY, GEORGE
Anecdote of the stoat's preying upon bats, 1204; Exotic spiders imported in dye-wood, &c., 1219; *Dreissena*

- polymorpha in unnavigable water, 1420
- WOLLEY, J.
 Noctule flying in November, 1206 ;
 Spoonbill in Andalusia, 1213 ; Occurrence of the rough-legged buzzard in Nottinghamshire and Derbyshire, 1247 ; Shrew and grasshopper warbler, 1297 ; Occurrence of *Vanessa Antiopa* near Nottingham, 1506 ; of *Acherontia Atropos* at Cambridge, 1508 ; of *Sphinx Convolvuli* near Nottingham, 1513 ; of the locust near Nottingham, 1520 ; occurrence of the black swan in Britain, 1554
- WORTLEY JAMES STUART
 Inquiry respecting the name of a bird, 1499
- VAUGHAN, P. H.
 Note on *Sphinx Ligustri*, 1514

ALPHABETICAL LIST OF SUBJECTS.

- Abax, deviation from the usual formula of *Striæ* in, 1357
- Acherontia Atropos* at the Land's End, Cornwall, 1345 ; Occurrence of, in Norfolk, 1507 ; near the Land's End, 1507 ; Observation on, 1507 ; Occurrence of, near Bristol, 1507 ; at Chelmsford, 1507 ; Observation on the occurrence and seasons of, 1507 ; at Cambridge, 1508 ; at Chipping Norton, 1508 ; near Cambridge, 1508 ; near Leicester, 1508 ; near Hessel-upon-Humber, 1508 ; of the larvæ at Clonmel, 1508 ; of the larvæ at Morpeth, 1508
- Acidalia aversata* and *A. remutata*, varieties of one species, 1227
- Acronycta Alni*, 1226 ; larvæ of, 1228
- Adder, a lady bit by, 1263
- Aepus fulvescens* near Ventnor, Isle of Wight, 1357
- Agrotis saucia* at Hammersmith, 1515
- Alligator oil, 1503
- Amphipepla involuta*, Irish locality for, 1216
- Anecdote of a thrush, 1210 ; of a robin, 1211 ; of heron's fighting, 1212 ; of a stoat preying upon bats, 1204 ; of a sparrow, 1298 ; of a fox, 1365
- Animals, effects of music on, 1295 ; Singular effect on, from swallowing the ashes of *Hecla* with their food, 1364
- Anthophora retusa*, note on a hermaphrodite specimen of, 1282
- Anthus arboreus* in February, 1210
- Apatura Iris*, capture of, at Poynings, 1505
- Aphides, note on, 1288
- Apes, at Gibraltar, 1292 ; Gibraltar or Barbary, 1293
- Aphis of the apple, 1359 ; of the hop, 1461
- Appearance of *Lepidoptera*, proposed mode of recording dates of, 1224
- Argynnis Lathonia*, near Norwich, 1505 ; near Dover, 1505
- Auk, little, occurrence of, near Downham, 1502
- Australian spider, remarkable habits of, 1219 ; Caterpillar and parasite, 1226 ; Natural History, notes on, 1422, 1485 ; Spine-tailed swallow in England, 1492
- Bats, anecdote of a stoat preying on, 1204
- Battle between a dragon-fly and wasp, 1242
- Bearded titmouse, occurrence of, near Land's End, 1298
- Bees, description of British species of, 1274, 1445 ; Supplementary paper on, containing descriptions of a few species recently discovered or omitted in

- the description of the genera to which they belong, 1566; on destroying, 1459; Note on queen, 1355
- Beehive, immense natural, 1354; increase and decrease in the weight of, 1355
- Birds of Belgium, 1251; observed in South-eastern Durham and North-west Cleveland, additions to Catalogue of, 1261; summer, arrival of at Shooter's Hill, 1295; found in Norfolk, 1300, 1373; ventriloquism in, 1371; water, remarks on submergence of, 1395; enquiry respecting, 1499; effect of captivity on the appetite of, 1502; at sea, 1502; mentioned in Shakspeare's plays, 1539; nidification of some Australian, 1546; arrival of at Warnford in 1846, 1547; migratory, remarks on, in the vicinity of Holmes Chapel, 1547; dates of arrival of in Norfolk, Suffolk,² and Cambridge, 1549
- Bittern, American, near Fleetwood, 1248
- Blackberries attractive to moths, 1524
- Blackbirds hatched by a canary, 1210; young white, 1367
- Blight, American, 1460
- Bones, cattle mouthng, 1246, 1295, 1365, 1366
- Brambling near Ross, 1211
- Bunting, snow, occurrence of, near Burton-on-Trent, 1209
- Buprestis, singular use for at Madras, 1357
- Butterflies, migration of, 1273, 1442, 1443
- Buzzard, rough-legged, occurrence of, in Notts and Derby, 1247
- Cabinets, to expel and exclude mites from, 1524
- Calendar, Naturalist's for January, 1201; for February, 1233; for March, 1249; for April, 1325; for May, 1337; for June, 1345; for July, 1398; for August, 1438; for September, 1441; for October, 1473; for November, 1505; for December, 1546
- Callimome versicolor, 1356
- Canary, blackbirds hatched by, 1210; habit of, 1367
- Captivity, effects of, on the appetite of birds, 1502
- Capture of whales at the Faroe Isles and at Lerwick, 1207; of Lepidoptera near Manchester, 1220, 1223; of *Peroneæ* at Hainault Forest, 1228; at Lewisham, 1229; on the Downs near Godstone Road, 1228; in Scotland, 1229, 1354, 1439; of rare moths near Lyndhurst, 1230; of Coleoptera in the North of England, 1237; of the gray shark in Cornwall, 1337; of *Acherontia Atropos* at the Land's End, 1345; of *Deilephila Celerio* at Manchester, 1346; at Birmingham, 1518; of *D. Lineata*, 1345; at Hammersmith, 1346; of *Cleora*, or *Ephyra pictaria*, 1347; of *Orthosia leucographa*, 1347; of *Pterophorus tridactylus* on the 25th of February, 1348; of Lepidoptera at Hammersmith, 1348; at Arundel, 1350; at Black Park, Bucks, 1352; near Ambleside, 1439; at Keswick, 1440; in the vicinity of Lewes, 1440; of *Hadena rectilinea*, 1444; of Lepidoptera in the Isle of Wight, 1444; of *Lamia ædilis* in the Black Forest, Rannock, 1460; of *Trichius fasciatus* near Loch Rannock, 1460; of the goshawk, 1496; of *Apatura Iris* at Poynings, 1505; of *Vanessa Antiopa* near Stowmarket, 1504; at Camberwell, 1505; at Ipswich, 1506; at Kensington, 1506; of the larvæ of *Acherontia Atropos* near Morpeth, 1508; of *S. Convolvuli* near Winchester, 1510; of *Catocala Fraxini* at Manchester, and *C. sponsa* at Darenth Wood, Kent, 1515; of *Trochilium Allantiforme* at Greenhithe, 1515; of *Lithosia pulchella*, near Epping, 1515; of *Emmelesia Blomeri* at Chenies, 1516; of *Nebrida livida* at Bridlington; 1517; of *Tapinotus sellatus*, 1517; of the locust on Peckham Rye, 1518; at Hammersmith, 1521; of a large sturgeon in the Usk, 1555
- Carnivorous propensity of the hedgehog, 1204, 1245, 1293; of the common slug, 1216
- Catocala Fraxini* at Manchester, 1515; *C. sponsa* at Darenth Wood, 1515
- Cattle mouthng bones, 1206, 1246, 1295, 1365, 1366
- Chaffinch, quail, and ringdove, note on, 1367
- Chalcidites, parasitism of, 1233
- Chiffchaff, early arrival of, near Swansea, 1496
- Cockatoo laying eggs in confinement, 1210
- Cleora*, or *Ephyra pictaria*, capture of, 1347
- Coleoptera, capture of, in the North of England, 1237; treatment of when captured, 1240; on the use of moisture in collecting, 1282; of South Wales, note on the, 1284; on compa-

- rative dates of the occurrence of some species, 1359
Colias Edusa, appearance of, in the Isle of Wight, 1441; on the periodic appearance of, at Charmouth, Dorset, 1442
 Colour of insects, found on the coast, variation in, 1283
 Cuckoo, note on, 1394
Convolvulus hawk-moth at Stanford Rivers, Essex, 1444
 Cow pumping water, anecdote of, 1206
 Crab, anecdote of, 1265
 Crossbill, white-winged at Derby, 1247; occurrence of, at Knaresboro', 1367; near Thetford, 1498; near Carlisle, 1551.
 Crow, hooded, occurrence of, near Stourbridge, 1550
Cygnus atratus, note on, 1327
Cynæda dentalis, occurrence of, at Lewes, 1516
 Death's-head hawk-moth at sea, 1443; at Barton-on-the-Heath, 1443
Deilephila Celerio, capture of, at Manchester, 1346; at Great Baddow, 1514; near Leicester, 1514; at Birmingham, 1515; at Lewes, 1515; *D. Lineata*, capture of, 1345; at Hammersmith, 1346; *D. Livornica*, occurrence of, near Cork, 1444; near the Land's End, 1514; near Lewes, 1514; in London, 1514
Delphinorhynchus, note on a species of, 1527
 Description of the spotted eagle, 1207; of the larvæ of *Orthosia opima*, 1227; of ten new British moths, 1260; of *Perga scabra*, 1274; of a new species of *Haltica*, 1517
 Disease among fish, 1215
 Desmudiæ, new work on the British, 1243
 Distribution of the species of *Harpalus* and *Ophonus*, 1236
 Dog, common, on the varieties of, 1201
 Domestication of wood-pigeon, 1248
 Dragon-fly, and wasp, battle between, 1242; carnivorous propensity of, 1240; list of British, 1522
Dreissena polymorpha in unnavigable water, 1420
 Duck, extraordinary feet in, 1214; tufted, early appearance of, 1214; Steller's western, at Filby, Yorkshire, 1249
Dytiscus, discrepancy between the two antennæ of, 1518
 Eagle, spotted or silver, 1207, 1246
 Economy of *Selaudria Cerasi*, 1234; of *Melœ*, 1240
 Eels, polecat preying on, 1204; singular mode of catching, 1216; further remarks on the habits of, 1264; rats fishing for, 1364
 Eggs, of Savi's warbler, 1212; of a flesh-fly deposited in a living toad, 1215; note on miscolored, 1393; laid by a tortoise, 1399; found in a tortoise, 1399; curious fact respecting starling's, 1550
Emmelesia Blomeri, capture of, at Chénies, 1516
Empis borealis, 1354
Endromis versicolor, 1344
 Enquiry respecting the black rat, 1294; name of a bird, 1499; the tumbling of pigeons, 1500
Eulophus Agathyllus, 1458
 Excursion, ornithological, to the North coast of New Holland, 1481
 Exhibition of strength in the larva of one of the Staphylinites, 1238
 Exploding property of *Pausidæ*, 1357
 Father lasher's capability of living in fresh water, 1215
 Fieldfare, song of, 1297
 Feeling of insects, 1434, 1524, 1525, 1526
 Ferocity of the blue-headed titmouse, 1367
 Fish, disease amongst, 1215; tadpole, off Sherringham, 1264; toad, of New South Wales, 1341
 Fishes of the Land's End, notes on, 1400
 Fishing, curious mode of, in India, 1340
 Flesh-fly, eggs of, deposited in a living toad, 1215
 Flowers attractive to moths, 1225, 1341
 Fox, common, on the varieties of, 1202; *Pisidium pusillum* attracted by the skull of, 1266; admirable sagacity of, 1365
 Frog, revival of a frozen, 1214
 Geese, wild, remarks on tracheæ of, 1249; occurrence of, with terns and gray phalaropes at Worcester, 1555
 Glow-worm, male, luminous, 1459
 Gnats, immense swarm of, 1444
 Goldfinch, habit of, 1367
Gonoplax Rhomboides, account of, 1217
 Goose, Egyptian, occurrence of, in Kent, 1501
Gordius aquaticus supposed to fall with rain, 1220
Gortyna Petasitidis, habitat of, 1347
Graphiphora renigera, 1273; *tristigma*,

- note on, 1347; cataleuca, larva of, 1347; subrosea, occurrence of, at Whittlesea Mere, 1515
- Goshawk, curious capture of, 1496
- Grasshopper warbler, 1297
- Grosbeak at Stowmarket, 1247
- Gull, herring, breeding in confinement, 1394
- Habits of the rook, 1210; of an Australian spider, 1219; of the polecat, 1244; of the eel, further remarks on, 1264; of *Melitæa Cinxia*, 1271; of the tortoise, 1336; of the raven, 1366; of the goldfinch, 1367; of *Macrocnema marcida*, 1459; of the swift, 1499; of the kingfisher, 1551
- Hadena rectilinea*, 1444
- Haltica*, note on the species of, 1239; *H. consobrina* in the Isle of Wight, 1239; description of a new species of, 1517
- Harpalus*, distribution of, 1236
- Harrier, Montagu's, nesting of in Norfolk, 1496
- Hedgehog, carnivorous propensity of, 1204, 1245, 1293
- Hermaphrodite specimen of *Anthophora retusa*, 1282
- Herons fighting, anecdote of, 1212; purple, at Penzance, 1331
- Hop-fly, 1461
- Hops and hopflies, 1521
- Hybrid between lion and tigress, 1462
- Hymenoptera, duration of, in the larva state more than one season, 1458
- Incubation of ringed plover, 1212
- Insects feeding on mineral substances, 1230; found on the coast, variable in size and colour, 1283; treatment of, when captured, 1342, 1344, 1437, 1438; sensibility of, 1434, 1437, 1524, 1525, 1526, 1556; on killing and relaxing, 1343; inhabiting oak-apples, 1454
- Instinct, power of, in the oak egger-moth, 1346
- Jack, large sized, 1419
- Kestrel preying upon a rat, 1550
- Kingfisher, great belted, in Ireland, 1212; common, habits of, 1551
- Lamia ædilis* in the Black Forest, 1460.
- Land-rail shot in January, 1299
- Lark, crested, near Penzance, 1497
- Lasiocampa Trifolii* near the Land's End, 1226, 1515; near Manchester, 1226
- Lepidoptera near Manchester, 1220; around London, 1223; recording dates of, 1224; flowers attractive to, 1225, 1341; at Lewisham, 1229; on the Downs, near Godstone Road, 1229; in Scotland, 1222, 1439; near Lyndhurst, in the New Forest, 1230; descriptions of New British, 1266; at Hammersmith, 1348; at Arundel, 1350; at Black Park, 1352; at Doncaster, 1353; in Scotland, 1354; at Ambleside, 1439; at Keswick, 1440; at Lewes, 1440; in the Isle of Wight, 1444
- Libellulidæ*, list of British, 4522
- Lion and tigress, hybrid between, 1462
- Lithosia pulchella*, near Epping, 1515
- Locust near Knaresborough, 1460, 1518; on Peckham Rye, 1518; in Hyde Park, 1518; at Kingsbury, 1518; in Yorkshire and Devonshire, 1518; at Camberwell, 1519; near London, 1519, 1520; near Epping, 1519; near York, 1519; in Cornwall, 1519; near Richmond, Surrey, 1519; near Leicester, 1519; near Worcester, 1519; near Nottingham, 1520; near Redcar, 1520; near Uppingham, 1520; near Chelmsford, 1520; in the North of England, 1520; near Yarmouth, 1520; in Glamorganshire, 1521; in Norfolk, 1521; at Pegwell Bay, 1521; at Hammersmith, 1521; at Duxford and Fulborne, 1521; in Scotland, 1521
- Martin, house, late stay of, at Alton, 1247
- Macrocnema marcida*, habits of, 1459; on *Cakile maritima*, 1516
- Melitæa Cinxia*, habits of, 1271
- Melœ, economy of, 1241
- Melolontha Hippocastani* in Ireland, 1238
- Miana strigilis* and *Æthiops*, 1348
- Microscopical Society of London, 1242, 1360
- Migration of butterflies, 1272, 1442, 1443; partial, as applying to the parish of Melbourne, 1470; in East Lothian, 1332
- Mites, to expel from cabinets and to exclude them, 1524
- Mode of recording dates of appearance of Lepidoptera, 1224
- Mollusca found in Cornwall, 1420
- Moorhen, submergence of, 1325; further notes on, 1369
- Moths, flowers attractive to, 1225, 1341; description of ten new British, 1266; blackberries attractive to, 1524

- Music, effect of, on animals, 1295
Miselia Oxyacanthæ, varieties of, 1227
 Natural History of New South Wales, 1422, 1485
 Naturalist's Calendar for January, 1201 ; for February, 1233 ; for March, 1249 ; for April, 1325 ; for May, 1337 ; for June, 1345 ; for July, 1308 ; for August, 1438 ; for September, 1441 ; for October, 1473 ; for November, 1505 ; for December, 1546
Nebria livida at Bridlington, 1517
 Nest of Savi's warbler, 1212
 New South Wales, Natural History of, 1422
 Nidification of Australian Birds, 1546
 Nightingale in Monmouthshire, 1211 ; northern range of, 1298 ; protection to, 1368 ; in Devonshire, 1393
 Noctule flying in November, 1206
 Norfolk swan fattening, 1250
Notidanus griseus, description of, 1337
Notoxus monoceros near Norwich, 1517
 Nuthatch, remarks on, 1498
 Oak-apples of America, 1281 ; insects inhabiting, 1454
 Oak-galls, note on, 1457
 Oak egger-moth, power of instinct in the, 1346
Odontopera bidentata, larva of, 1228
 Oil, alligator, 1503
 Oil-gland, the, 1250, 1393
Ophonus, distribution of, 1236
Oreynus ala longa, description of, 1413
 Ornithological excursion to the North coast of New Holland, 1481 ; note, 1368 ; wonder, 1523
Orthosia opima, description of larva of, 1227 ; *O. leucographa*, 1347.
Orthosia near Doncaster, 1353
 Owl, great horned, 1498
 Oyster-catcher inland, 1212 ; longevity of, 1501
Papilionidæ at Wansbeck, 1432
 Parti-colored thrushes, 1496
Paussidæ, exploding property of, 1357
Pardix virginiana in Surrey, 1394
Perga scabra, description of, 1274
Peroneæ at Hainault Forest, 1228, 1516
 Petrel, stormy, in London, 1502
Phalarope, red-necked, in Sussex, 1394, in Norfolk, 1552 ; gray, near Penzance, Honiton, and Preston, 1552 ; near Worcester, 1555
 Pheasant, note on the, 1500
 Pigeon, enquiry respecting the tumbling of, 1500
Pipit, Richard's, near Newcastle, 1210
Psidium pusillum attracted by the skull of a fox, 1266
Platyrhinus latirostris near Cheltenham, 1517
Platygaster, note on, 1235
 Plover, ringed, incubation of, 1212
 Polecat preying upon eels, 1204 ; remarks on the piscatory habits of, 1244
Pseudotomia atromargana and *strobilella*, 1228
Psychophora trepidaria, 1274
Pteromalus puparum, note on, 1535
Pterophorus tridactylus, capture of, on the 25th of February, 1348
 Quail shot in Worcestershire in January, and land-rail shot in January, 1846, 1299 ; note on, 1367
 Rail, water, 1299
 Raine's Islet, an account of, 1473
 Rat, black, enquiry respecting, 1294 ; kestrel preying upon, 1550 ; fishing for eels, 1364
 Raven, habits of, 1366
 Redpoll staying at Thetford throughout the summer, 1497 ; lesser, nesting of in Norfolk, 1497
 Relaxing insects, 1343
 Reptiles, Cornish, 1503
 Rhodites of the rose-gall, 1359
 Richard's pipit near Newcastle, 1256
 Ringdove, note on, 1367
 Robin, anecdote of, 1211 ; capturing its prey, 1393 ; curious nesting place of a pair, 1368 ; a household, 1368
 Rook, remarkable habit of, 1210 ; building upon house-tops, 1366
Salicaria luscinioides, nest and eggs of, 1212
 Sandpiper, broad-billed, in Sussex, 1394 ; buff-breasted, near Penzance, 1500
 Savi's warbler, nest of, 1212
 Sea bream, Spanish, at Sherringham, 1555
Selandria cerasi, economy of, 1234
 Sensibility of insects, 1434, 1437, 1524, 1525, 1526, 1556
 Shark, gray, account of the capture of in Cornwall, 1337
 Shrew and grasshopper warbler, 1297
 Shrike, great ash-coloured, near Burton-on-Trent, 1209
 Slug, carnivorous propensity of, 1216 ; food of, 1503
 Snipe, common, in captivity, 1333 ; sound produced by, 1501, 1552 ; Sabine's, in Hampshire, 1300 ; near Clonmel, 1500

- Sparrow, anecdote of, 1298
 Sphinx *Convolvuli* at Camberwell and Faversham, 1509; at Clonmel and Dunmore, 1509; near Norwich, 1509; near Epping, 1509; at Cambridge, 1509; near York, 1510; near Kingsbury, 1510; near Winchester, 1510; in City Road, London, 1510; near Tonbridge Wells, 1510; at Sudbury, 1510; at Aylsham, 1511; in Yorkshire, 1511; near Hessle-upon-Humber, 1511; near Leicester, 1511; at Blackheath, 1511; at Leyton, 1512; near Yarmouth, 1512; near Redcar, 1512; at Hackney, 1512; near Uppingham, 1512; at Brislington, 1512; at Chipping Norton, 1512; with *Acherontia Atropos* near Hull, 1513; near Nottingham, 1513; at Hythe, Kent, and at Chelmsford, 1513; and *Acherontia Atropos* at Tooting, 1513; near Faversham, 1513; near the Land's End, 1513; *S. Ligustri*, length of time required in the change from the larva to the pupa state, 1346; note on, 1514; *S. Nerii* near Ham-burgh, 1514
S. (Deilephila) Galii at Lewes, 1514; at Faversham, 1514
 Spiders, exotic, imported in dye-woods, &c., 1219; remarkable habits of an Australian, 1219
 Spoonbill in Andalusia, 1213
 Staphylinites, exhibition of strength in the larvæ of, 1238
 Starling, white, and curious facts respecting starlings' eggs, 1550
 Stoat, anecdote of, preying upon bats, 1204
 Stork, white, near Fermoy, 1394; near Driffeld, 1501
 Stormy petrel in London, 1501
 Sturgeon, huge, in the Wye, 1419; in the Usk, 1555
 Swallow, migration of, 1211; at the Carron Iron Works in winter, 1247, 1297; late stay of, at Penzance, 1247; early arrival of, in Cornwall, 1368; late departure of, at Redcar, 1368; Australian spine-tailed in England, 1492; note on a white, 1500; new to Britain at Uppingham, 1550; anecdote of confidence in, 1551
 Swans, singing of, 1214; fattening, 1250; rusty tinge of, 1300; black, 1327; in Scotland, 1501; in Britain, 1554
 Swift, singular habit of, 1499
 Tadpole-fish off Sherringham, 1264
Tapinotus sellatus, 1517
 Tenacity of life, remarkable instance of, 1357
 Terns, near Worcester, 1555; near Pont-y-pool, 1555
 Tetrastichus, note on, 1232
 Thrush, anecdote of 1210; parti-coloured, 1496
 Tigress and lion, hybrid between, 1462
 Titmouse, bearded, near Land's End, 1298; note on the early breeding of, 1497; blue-headed, ferocity of, 1367
 Toad, eggs of a flesh-fly deposited in a, 1215; fish, 1341
 Tortoise, remarks on, 1336; egg laid by 1399; eggs found in a, 1399
Trichius fasciatus near Loch Rannock, 1460
Tringa Schinzii near Penzance, 1554
Trochilium Allantiforme at Greenhithe, 1515
 Trolling, extraordinary, 1341
 Trout, memorandum of spawning of, 1215, 1264
Trypodendron domesticum in the vicinity of Newcastle-upon-Tyne, 1357
 Vanessa *Antiopa* at York, 1504; near Epping, 1504; at Winchester, 1504; near Stowmarket, 1504; near Lincoln, 1505; at Camberwell, 1505; at Ipswich, 1506; at Kensington, 1506; at Tottenham, 1506; at Streatham, 1506; in the Isle of Wight and near Leatherhead, 1506; near Leicester, 1506; near Woburn, 1506; at Limehouse, 1506; at Mickleham, 1506; near Nottingham, 1506; at Saffron Walden, 1507; near Norwich, 1507
V. urticæ, appearance in winter, 1273
 Ventriloquism in birds, 1371
 Virginian colin in Surrey, 1394
 Wagtail, white, in Kent, 1497
 Warbler, Savi's, nest of, 1212; grasshopper and shrew, 1297
 Wasp insectivorous, 1233, and dragon-fly, 1242
 Water-rail, note on, 1299
 Weasels hunting in packs, 1462
 Weather, effects of mild, 1298
 Weaver-bird, crimson, in Kent, 1499
 Whales at the Faroe Isles, 1207; at Lerwick, 1207; stranded on the Belgian coast, 1462, 1528
 Wheatear, singular variety of, 1496
 Whidah-bird, red-billed, in Kent, 1497
 Wolf, American, variety of, 1526

Wonder, ornithological, 1523

Woodpecker, great black, near Knaresborough, 1298

Wood-pigeon, domestication of, 1248

Zoologist, the, wanted at Derby, 1523

ALPHABETICAL LIST OF ILLUSTRATIONS.

Anacampsis lophyrella, 1268

Anacampsis instabilella, 1268

Argyrotoza Audouinana, 1268

Bittern, young of the, 1321

Brambling, white, 1311

Cnephasia conspersana, 1268

Cochylis affinitana, 1268

Depressaria rotundella, 1268

Duck, ferruginous, bony labyrinth of trachea, 1379

Duck, supposed hybrid, 1379

Eagle, spotted, 1208

Grebe, eared, in summer plumage, 1381

Kittiwake, young of, 1383

Macropis labiata, male and female, 1280

Orthotænia quadrana, 1268

Orthotænia venustana, 1268

Pochard, bony labyrinth of trachea, 1379

Pæilochroma occultana, 1268

Sandpiper, young of wood, 1324

Sericoris tenebrosana, 1268

Shark, gray, 1337

Swallow, spine-tailed, 1492

Tunny, long-finned, 1413

Warbler, Savi's, nest of, 1307.

THE ZOOLOGIST.

FOR 1846.

NATURALISTS' CALENDAR FOR JANUARY.

BIRDS.—In mild, open weather, we occasionally hear the song of the thrush (*Turdus musicus*), and of the missel thrush (*T. viscivorus*), during this month; and the hedge-sparrow (*Accentor modularis*), wren (*Troglodytes Europæus*), and a few more of our resident songsters also enliven us with their notes. The golden plover (*Charadrius pluvialis*) is to be met with in immense flocks on commons and open fields in all the southern counties of England. Although great numbers of these birds breed in the northern counties of England, and in Scotland, it is probable we have a large addition to our native birds from those which have been bred in still more northern latitudes, and travel south at the approach of winter, to escape the rigours of a polar clime.

INSECTS.—Although but a few insects are stirring at this early season, yet many Coleoptera may be found under the bark and at the roots of trees. Towards the end of the month, if the weather is mild, some Lepidoptera begin to appear. The first moth is usually *Cheimatobia rupicapraria*; the males may be found flying at dusk by the sides of hedges, and the wingless females sitting on the twigs, but the latter are more frequently to be met with just before daylight in the morning. The spring usher moth (*Anisopteryx leucophearia*) and the pale brindled moth (*Phigalia pilosaria*) may be found resting on the trunks of trees in woods during the day; in some seasons in great plenty, in others in far less numbers. Several of the minute moths may also be found, but most of these are species which have emerged from the chrysalis in the autumn, and survived the winter in the perfect state; among these may be mentioned several *Depressaria*, and some of the beautiful *Peroneæ*, or button moths.—Henry Doubleday, in *Naturalists' Almanac* for 1845.

On the varieties of the common Dog. Since my last communication to you (Zool. 1159), on the subject of the different varieties of the dog, I have employed a considerable portion of my time in the consideration of this most curious subject. It seems to me that there are two different methods by which varieties may arise. *First*, by constantly preserving those of a litter which shew the peculiarities which we wish to perpetuate. In this way we shall gradually increase the peculiarity; for instance, taking one peculiarity alone, say in the case of rabbits, I breed a litter two or three

of which have larger ears than the others, crossing these with others possessing the same abnormal form in an equal degree, I conceive that there is a chance of the progeny, or some of them exceeding either of the parents in monstrosity, and by constantly selecting the best marked of these varieties, I gradually obtain animals very different in that respect from their ancestors. The breed of dogs called King Charles's spaniels, as represented in the pictures of Vandyke, have the same peculiarities as those of the present day, the short muzzle, high arched forehead, long ears, &c., but not in the same degree, while there is no cross which would tend to produce these characteristics, inasmuch as no breed has them so strongly marked. The present dogs, therefore, must be derived from what I may call *superlative* varieties of the former one. The same may be said of other breeds which have been gradually improved by careful and attentive breeding. Now this alone would in the many ages which have elapsed since the dog has been domesticated by man, produce strongly marked distinctions and give rise to many kinds of dogs, which not only have no wild type but never could have had, since dogs of the very slight speed and defective powers of scent which some of our artificial stocks have, could never exist in a state of nature, they would be starved. The *second* mode of obtaining varieties is by crossing the former, and when once the system of breeding between different varieties is commenced the results are almost infinite: it is well known that a bitch once put to a dog of another breed will often throw puppies like him even to dogs of her own sort. I have seen what seemed to me a pure-bred setter, which I was informed was the offspring of two pointers, nay more, that the bitch never had a litter without a setter in it. This might have arisen from two causes, either from the bitch having formerly had a litter by a setter, or from their being a cross of the setter in her stock. If then the bitch had been put to a dog of a different breed, say to a greyhound, would it surprise you to see one puppy of the litter a lurcher with the coat of a setter, a Persian greyhound in fact? This will shew that a multitude of breeds may be produced, where once well-marked stocks begin to be intermixed. Now the classification which I should propose for varieties is this. Take an original form (I fancy that no breed we have now is so well defined as to say of it, "this is the type of the form"), arrange on one side the different crosses which we suppose it to have met with, and the results of those crosses, on the other side the breeds which appear to be modifications or but slight alterations produced by education and circumstances of the original. Thus:—

<i>Modifications.</i>		<i>Crossed with.</i>		<i>Results.</i>
Bloodhound	Hound	Smaller Bulldog	=	Spanish Pointer
Foxhound		Spanish Pointer	=	English Do.
Harrier		Poodle	=	Spaniel
Coachdog.		Smooth Terrier	=	Beagle
		Scotch Do.	=	Otter Hound
		Larger Mastiff	=	German Boarhound.

I give this as a specimen. This might be carried out with such types as we have. I am far from supposing, as some do, that the most strongly marked form is the original one; as I said before, I fancy the most marked peculiarities have been produced by selections of breeders. I am inclined to think that by a combination of these two causes and an attentive consideration of them, the thousand and one breeds of dogs may be reduced to about half a dozen original forms combined and improved. What

are there which we cannot trace to these,—Hound, Mastiff, Spitz, Greyhound, Poodle, Terrier? If indeed the Poodle be not a cross between Spitz and Hound. Now, whether these were originally distinct species or not is a matter of great uncertainty. Whether the Spitz is derived from a Wolf, the Greyhound from the Indian Dhole, and the others from other Canidæ is a question which cannot be set at rest till we know more about the conditions under which hybrids are prolific. What difficulty is there in supposing that dogs were originally attached to man by the Creator, and distributed as his companions when the human race was dispersed, and this to each as he had need? One sort to one, one to another, and yet fitted to combine into other forms as increased necessities demanded. This is but a mere speculation, it cannot be more, but there is nothing in it inconsistent with the care which the Almighty takes for his creatures. Man was to subdue the earth, and the fear of him, and the dread of him was to be upon every beast of the earth. And what more efficient aid could he have in subduing the earth than the most noble of brutes, who, even now is such a powerful assistance to him.—*H. T. Frere; Aylsham, Norfolk, November, 6. 1845.*

On the varieties of the common Fox.—A notion prevails here, which I am pretty sure is correct, that in our covers are three distinct kinds of foxes, which are known to country people by the names of greyhound fox, common fox, and little red fox. Most people who have hunted with fox-hounds, and had opportunities of observing these animals, cannot fail to have observed the great difference which exists between different individuals of them, as regards their form, colours, speed and manners, and I think there are very few who would not, at first sight, pronounce them distinct species. Naturalists, however, appear to regard them as only varieties, and certainly we must yield in opinion to those who have, like them, the best opportunities of ascertaining the fact. The subject, however, appears to me as if it would repay further investigation, and I leave it in the hands of those who have more ample opportunities than myself of examining it thoroughly. Pennant evidently considers them as only varieties. Bell omits all mention of them, and Mr. Newman (Zool.) alludes to them as “well-marked varieties, which most sportsmen call species.” This latter part of our editor’s observation is strictly true; sportsmen certainly consider them species. The three kinds which exist in this neighbourhood are

1st. *The Common Fox.* Too well known to require description.

2nd. *Greyhound Fox.* The outline of his form resembles that of a greyhound dog; he is larger in size, longer on the legs, more slender in form, and of swifter speed than the common fox, generally giving more enduring and faster chases. I have known one of these animals run four hours before hounds, and he generally leaves the cover in dashing style. In colour he resembles the common fox, but has almost invariably some grisley or silver hairs in his coat. His head is large and sharp-looking, rather broad across the cheeks, ears broad and large, nose thin and pointed, and the jet black hairs growing from the upper jaw are some of them three inches in length. There are, every season, several of these foxes in Charwood Forest, and the head of one killed from that locality measured as follows: Length of the head, measuring from between the ears to the tip of the nose, $7\frac{1}{2}$ inches. Space between the ears, $3\frac{1}{2}$ inches. Length of the ears, $3\frac{1}{2}$ inches. Ears tipped with black. Circumference of the cheeks, measured just below the ears, 16 inches. Space between the eyes, $2\frac{1}{2}$ inches.

Little Red Fox. This is an animal of much smaller dimensions than the common fox, and although I have seen several killed before hounds, I have never had an

opportunity of measuring the proportions of one. Its form is short, compact, and thick, and the colour of its coat red, hence its name. It seems to prefer the oldest covers and woods, and is supposed by many people to be the original fox of Britain, or the one from which all other kinds are descended. When leaving cover they do not gallop off boldly before the hounds, but endeavour to *steal* away cautiously and unperceived, generally affording the best sport, but sometimes the most protracted runs. For so small an animal, their endurance is very considerable, often knocking up the best bred hounds and horses. Wm. Hewett, Esq., of Reading (formerly of East Ilsley), says, "I was with the Craven hounds about five years ago, and viewed a small red fox away from a piece of gorse, which gave us a *run of sixteen miles from point to point, without a check*, threading woods of 500 acres, when at last she was run into from being caught in a wire. There were only six up at the death out of sixty or seventy at the meet, and when the second whip went into the wood for the fox, I made a remark to Mr. Villebois that the fox we found was a remarkably small one, and red, and on being brought out she proved to be the same." This animal is found in some parts of Nottinghamshire, Derbyshire, Leicestershire, and Berkshire.—*John Joseph Briggs, King's Newton, Melbourne, October 7, 1845.*

Anecdote of the Stoat's preying upon Bats. It has occurred to me that the following account of, I believe, an unnoticed habit of the common stoat (*Mustela erminea*, Linn.) might not be unacceptable. About four years ago, on a fine afternoon in May, as I was sauntering near a brook, on the foot-road from Beeston to Nottingham, I observed a stoat descending the perpendicular trunk of a large elm, with some dark object in its mouth, as I supposed, a young bird. I did not disturb it, but watched it into a hole in the brook side. Almost immediately it reappeared, climbed the tree again, and entered a hole about twenty feet from the ground; in a minute or two, it came out with its prize, which on my showing myself, it dropped, and ran back into the hole. Its prey proved to be the common bat (*Vespertilio murinus*, Linn.) I climbed the tree, and saw the animal's eyes glaring in the hole, but, perhaps luckily for my hand, the hole was too small to admit it, so that I was compelled to abandon the idea of capturing the stoat, or proving what I suspect, that the place was a large roosting place for bats, of which I caught another clinging to the hedge just by, evidently frightened out of the tree by the stoat. The fact of these animals climbing trees to such a height, I have never seen mentioned anywhere. It also shows that the bat, so secure from molestation on the wing, or when roosting in caves or clefts of rock, falls an easy prey to these bloodsuckers, when it trusts to the security of a hollow tree.—*George Wolley, 9, Cambridge-street, Liverpool, October 17, 1845.*

Polecat preying on Eels. Perhaps you will not think it too late to insert a few facts which I had intended to send up to 'The Zoologist' at the time they happened, but have neglected to do so from time to time. Bewick mentions eels having been discovered in the nest of a polecat; as I am not aware this has been noticed since his time, it may not be uninteresting to some of your readers to hear, that last year, our game-keeper being on Roydon fen, in this county, his attention was drawn to one of the pointers scratching vehemently at a burrow in one of the banks, he went to him, and assisted in turning out a nest, which his olfactory organs assured him was that of a polecat, in which lay a perfectly fresh eel, with his head eaten off. How he caught it is as much a problem now as when Bewick wrote, unless the eel was taking an evening walk on the grass as they do sometimes.—*H. T. Frere, Aylsham, Dec. 6, 1845.*

Carnivorous propensity of the Hedgehog. I have until within the last year or two

been a strenuous defender of the hedgehog from the charge of destroying game, which has been brought against it. The facts mentioned in 'The Zoologist' (Zool. 715), in the interesting paper "A last word for the poor Hedgehog," together with the assertions of several gamekeepers, with whom I have conversed on the subject, induced me to alter my opinion, as to its entire harmlessness; but the following fact, which came under my own observation last week, so fully convicts the animal in question of the charge of carnivorous habits, as to remove me from the list of his defenders. While walking one evening, I overtook a large hedgehog, which appeared just to have set out on its nocturnal rambles. I carried him home, and gave him the run of a small walled garden. In the middle of the second night of his captivity, I was awakened by the loud and alarmed cackling of a couple of fowls, the fattening tenants of a coop in the same garden. On looking out of my bed-room window, expecting to see some *biped* midnight plunderer, I could discover nothing but the dim outline of the coop. Upon listening, however, I heard the cries of the chickens repeated, but now with the addition of a perfectly different sound, for literally "thrice and once the hedgehog whined," and I was no longer at a loss to guess the cause of the alarm of the fowls. I immediately lighted a candle, dressed, and went out to inquire more particularly into the affair, expecting to find the urchin at the bars, scaring the imprisoned fowls. I found, however, that he had crept through a space not quite three inches in width, into the coop, and that he was engaged in close combat with one of the fowls, whose life's blood he would have drank, had not my timely arrival prevented the tragedy! From that moment the last remaining spark of my love and respect to his race as *an inoffensive and much maligned one*, was quenched. Until then I cherished the hope expressed by your correspondent, W. H. S., and by Mr. Waterton, in his very interesting Essays, that the carnivorous habits of the hedgehog were the effects of confinement, and a lack of their natural food, and did not arise from any innate propensity in them to prey upon these animals. But the case I have mentioned, destroys, I think, even this charitable hope. Here was the very experiment which W. H. S. suggested as one which ought to be adopted, in order "to try the matter quite fairly." A hedgehog is placed in a walled garden, which is known to contain beetles and other insects, he is also supplied with milk, yet on the very next night, instead of quietly feeding on his supposed natural food, he is discovered in the act of killing a full grown fowl, having insinuated himself through the narrow bars of its coop for that purpose! This is a case so strong, and having seen it myself, I can vouch for the accuracy of it, that unless carnivorous propensities are natural to the hedgehog, it is impossible to ascribe it to any other cause than Mr. Waterton's suggestion, that they are at the time "*not quite right in their head*." If it was so with my hedgehog, I can truly say *there was method in his madness*!

Having thus I fear too truly proved, that the poor hedgehog must no longer be considered an inoffensive animal, I think he still deserves the protection of the naturalist; for although "a necessary act incurs no blame," and the destruction of them in game preserves, is thus rendered necessary, yet wanton cruelty to this or any other of God's creatures, is a crime, which though still too prevalent among the lower classes, is I trust being materially lessened, by the influence of the increasing number of naturalists of the present day. The necessity of destroying animals of different kinds injurious to man cannot be denied by the most humane. As Cowper says,—

"If man's convenience, health,
Or safety interfere, his rights and claims

Are paramount, and must extinguish theirs.
 Else they are all—the meanest things that are—
 As free to live, and to enjoy that life,
 As God was free to form them at the first,
 Who in his sovereign wisdom made them all.”

John Pemberton Bartlett; Kingston Rectory, October 24th, 1845.

Noctule flying in November.—I have this evening seen the Noctule flying round Neville's Court, at a height of thirty or forty feet, and uttering its chirp, but less loud than usual. The air is foggy and warm, (Zool. 952).—*J. Wolley, Trinity College, Cambridge, November 21st, 1845.*

Anecdote of a Cow pumping water.—The following anecdote may prove interesting to some of your readers. While playing at cricket in a neighbouring field belonging to J. Clayfield Ireland, Esq. we were very much amused by watching his cow slake her thirst. As there is no pond in the field, a pump has been placed there, from which a stone basin below is generally kept filled for the horses and cow; she, however, being exceedingly nice in her taste prefers pumping the water for herself and catching it as it falls with her tongue. We have repeatedly seen her in the act of pumping, which the shape of her horns bending downwards, enables her to do with the greatest facility. Necessity, no doubt, prompted her in the first instance to that which has now become habitual.—*John Sircom, Jun.; Brislington, November 3rd. 1845.*

Cattle mouthing bones.—With respect to the ‘Singular Act performed by a Cow’, (Zool. 1105) I may observe that it seems to be by no means an uncommon occurrence for cows to suck or chew bones.

I have several times observed a certain herd of cows, on their way from the farm-yard to the pastures, when going over a fallow field, made a diligent search over it for any old bones they could find, and which are often contained in the manure and get spread over the land. One would suppose these anything but inviting food after having been in the fermenting dung clumps and exposed to various vicissitudes previously to their getting upon the land. Since reading the above-named article, I have spoken on the subject to the cow-keeper, who says he has long known this as a common practice among these animals, that they affect equally the old bleached bones I have spoken of, and those more recently from the flesh, and that they are more particularly prone to these carnivorous propensities at particular seasons of the year, and mentions just before harvest as one of them. He considers that their partiality for bones arises merely from their finding a palatable taste in them.—*A. Greenwood; Chelmsford, October 28th, 1845.*

Cattle mouthing bones.—The anecdotes recorded (Zool. 1048 and 1105) may perhaps throw some light on a singular circumstance that occurred a short time since near Toothill, Essex, when nine shoemaker's awls were found in the stomach of a bullock killed at that place.—*J. Taylor, Jun.; Chenies, Bucks.*

Cattle mouthing bones.—With reference to the communication in the last number of ‘The Zoologist,’ headed ‘Singular act performed by a Cow,’ related by Mr. Frederick Barlow (bearing also upon a former communication by Mr. Lewis), in which Mr. Barlow states that he observed the cow “for a considerable time with head up-lifted alternately protruding and drawing in, and at length dropping what he fancied was her tongue, but which upon examination proved to be part of a huge beef bone,” would you allow me to suggest whether it might not be possible that the cow adopted this plan of relieving some itching eruption of the mouth. This is of course only a

suggestion, but should you think it worth consideration, I should feel obliged by its insertion in 'The Zoologist.'—*T. W. Barlow ; Holmes Chapel, October 6th, 1845.*

Enormous take of Whales at Lerwick, September 22nd.—On Thursday last an immense body of whales visited Quendall Bay, and were received with every demonstration of rejoicing. The moment the cry of "whales coming!" was heard, one general and simultaneous rush towards the shore was made by the inhabitants. Boats were manned, axes shouldered, harpoons handled, knives laid hold of, old pickaxes, shovels, spades, pokers, hammers, and every other available lethal weapon held in requisition—plash went the oars, the excited rowers being stripped. What an animating sight! The dealing of deadly blows, the rushing in of the ponderous shoal, and the dying throes of the expiring monsters, all united in an incongruous harmony to add to the intensity of interest felt on the occasion. For two hours the deadly combat lasted; at last one loud and long shout of victory was raised from the triumphant Zetlanders, who stood gloating over 1540 whales! What a capture, and what a scene! No language can portray it, and therefore to attempt a description were needless. Not one escaped—all lay in one heap of slain. Some of the young men, when chasing the shoal into shallow water actually left their boats and sat astride the animals riding them to the shore. The history of the whale catching in Zetland does not afford an instance of such an extensive capture in such an incredibly short period of time. A handsome sum is expected to be realised by the captors as the reward of their labours.—*John o'Groat's Journal.*

Capture of Whales.—During the last six weeks the inhabitants of the Faroe Islands have captured no fewer than 2800 whales. A whole cargo of whalebone has been dispatched from these Islands to England; it is intended for manure. On the 5th instant one hundred and fifty bottle-noses got the finishing stroke at Sandwick; and on the same day at West Voe, off Sandburg, one hundred were captured and slain. The day was fine, and the scene at both places was of the most animating description. The blubber was next day sold at £10 per tun.—*Examiner, September 27th, 1845.*

Description of the Spotted Eagle. By EDWARD NEWMAN.

THE similarity between my figure and that just published by Mr. Yarrell in the Supplement to his History of British Birds, cannot fail to strike every ornithologist who has seen both engravings; but this similarity will, I trust, be satisfactorily explained when I inform my readers that both engravings were made from the same drawing, and therefore that neither is a copy of the other. The drawing was made by Mr. Robert Davis, of Clonmel, and kindly transmitted for the use of both publications.

From the circumstances already related of the occurrence of this bird (Zool. 1190), I think little doubt can be entertained that it is truly native in the South of Ireland, both the present specimen, and a second unfortunately not preserved, being evidently in immature plumage, and there is every reason to suppose that this eagle has long been known to the inhabitants of Ireland, and always supposed to be the Golden Eagle. This rich country seems almost a *terra incognita* to naturalists, and every succeeding month of 'The Zoologist's' existence seems destined to record some of its manifold treasures.

I quote from Mr. Yarrell's Supplement, to which I have already alluded, the following particulars.

"This Eagle, very similar in its appearance to our well-known Golden Eagle, but almost one third smaller in size, inhabits the Apennines and other mountains of central Europe. It is *le petit Aigle ou Aigle tacheté* of the Animal Kingdom of Baron Cuvier, who mentions that it was so tractable as to be employed in Falconry, but would only attack small or weak animals, and was otherwise deficient in courage. M. Vieillot includes this species in his Birds of France, and mentions that it preys upon pigeons, rats, and particularly upon ducks, from which latter circumstance it had been called *anataria*. It builds on high trees, laying two whitish eggs, slightly streaked with red, and it feeds on small quadrupeds and birds.



The Spotted Eagle. (*Aquila Nævia*).

"This species has been killed in Belgium, and is included by MM. Meyer, Brehm, and Naumann in their histories of the Birds of Germany; it is found also in Russia and Siberia, but not, I believe, in Denmark, Sweden, or Norway.

"South of the countries of Europe first mentioned, this Eagle is found in Provence, according to Polydore Roux and M. Schembri; and M. Savi includes it in his Birds of Italy. M. Malherbe says this species inhabits the centre of Sicily. One nest was discovered, containing two Eaglets and a mass of bones and skeletons of rabbits and reptiles; but that which created the greatest surprise was to find, underneath this large nest, seven nests of the Tree Sparrow, containing eggs and young birds; and these

little Finches seemed to apprehend no danger in establishing themselves thus near the habitation of so formidable an enemy.

"This Eagle is not found in Malta, but is said to inhabit North Africa, and is included by M. Savigny in his *Birds of Egypt* under the name of *Aquila melanotos*.

"M. Ménétries, the Russian Naturalist, in his catalogue of the zoological subjects obtained by him in the vicinity of Mount Caucasus, says, page 27, 'I killed on the mountains of Talyche an adult example of this species, which had almost entirely lost the spots observed upon it when it is young.'

"*Aquila nævia* has been obtained by B. Hodgson, Esq. in Nepal, and by Mr. Blyth near Calcutta; skins were in the collection made by Mr. Ewer in the north-western province of the Bengal territory, and also in that of Major Franklin.

"The young bird in its first year has the bill of a dark bluish horn colour, becoming lighter in colour towards the base, the cere yellow; irides hazel; the whole head, neck, back, wings, and tail dark chocolate brown; the tips of all the small and large wing-coverts marked with a crescentic patch of pale wood-brown; the tertials, upper tail-coverts and tail feathers the same; under surface of the body dark brown, the feathers of the thighs and legs varied with paler brown lines; the legs feathered down to the tarsal joint; the toes yellow, reticulated for a portion of their length, but ending with four large and broad scales; the claws nearly black.

"The young bird in its second year, as figured by Mr. Gould in his *Birds of Europe*, is more uniform in its colour than the bird here represented, but has some of the smaller wing-coverts, the greater coverts, and the tertials tipped with light brown; the general colour dark reddish brown.

"An adult bird had the neck, back, wing-coverts, and tail reddish liver-brown; the head, both above and below, rather lighter in colour, the feathers of the upper part of the head and neck lanceolate; the primaries almost black; under surface of the body very little lighter in colour than the back; all the feathers white at the base; legs, toes, and claws as in the young birds.

"The whole length twenty-seven and a half inches, the wing from the anterior joint twenty three and a half inches; the fourth and fifth quill feathers nearly equal in length, but the fifth rather the longest in the wing. The wings when closed reach to the end of the tail.

"Willughby in his *Ornithology* has accurately described this species at page 63, under the name of the *Morphno congener* of Aldrovandus, and adds, that 'this bird took the name of *Morphnos* from the spots of the feathers, whence also it may in Latine not unfitly be called *nævia*.'

"The young bird is the *Falco nævius* and *maculatus* of Gmelin."

Occurrence of the great ash-coloured Shrike and Snow Bunting, near Burton-on-Trent.—Two remarkable instances of uncommon birds having been killed by a very common weapon, occurred during this year in our immediate neighbourhood, which you will perhaps think worthy of recording in 'The Zoologist.' In April last, a plasterer, in the employment of my friend, Charles Arkwright, Esq., heard an unusual noise proceeding from a bird, which he could not then see, in a hedge near Dunstall, six miles from hence, and upon throwing a stone into it, he had the good fortune to knock down a fine male specimen of the Larger Butcher Bird, or Shrike (*Lanius Excubitor*). Again at the end of October last, a labourer, who was assisting in making a survey for one of the numerous railways projected hereabouts, killed with a stone in the meadows

near the River Dove, about a mile from this house, a male Snow Bunting (*Plectrophanes nivalis*), in its winter plumage. Both these birds are in my possession with a memorandum attached to each, of the mode and time of their capture. I need hardly add, that they are both very rare birds in our midland counties of Stafford and Derby.—*Oswald Mosley; Rolleston Hall, near Burton-on-Trent, November 19th, 1845.*

Remarkable habit of the Rook.—In the early part of January, 1843, whilst walking by the Serpentine River, I saw a rook flying to and fro over the surface of the water, it stopped several times close to the stream and at last plunged in, emerging almost immediately, and flew heavily away towards some high trees; a boy threw a stone at it, when the rook dropped a fish, and after flying round and round returned to its former occupation. The prey proved to be a dace, and was bleeding from the wounds of the rook's talons; the boy, who was generally watching the cows in the Park, told me he had before observed the rooks fishing, especially in cold weather.—*G. A. Thrupp; 1, Hyde Park Place, West, November 6th, 1845.*

Cockatoo's laying eggs in confinement.—Mr. Leyland, of this town has a cockatoo (the large white crested), which has been in his possession above fifteen years. On the 29th of May, 1843, it laid an egg for the first time, and another on the 26th of June in the same year. In 1844 it laid two more, one on the 29th of May and the 3rd of August. This year it has again laid two, the one on the 4th, and the other on the 7th of April. The eggs are of a delicate white colour and are rather larger than a pigeon's.—*Francis Richardson; Halifax, October 22nd, 1845.*

Anecdote of a Thrush.—This year during the breeding season, a pair of thrushes located themselves in a shed belonging to the Navigation Company, and forthwith proceeded to build their nest. It was placed on a shelf among some odd pieces of wood, and in it when finished, were laid four eggs, which after the usual period of incubation were hatched. The shelf on which the nest was built was not above five feet from the bench, at which three or four carpenters were continually at work.—*Francis Richardson, Halifax, October 22nd, 1845.*

Blackbirds hatched by a Canary.—Early in the spring of this year (1845), a hen canary of last year's brood, for whom no companion was found, had, by way of experiment, three blackbird's eggs placed in a nest she had amused herself by building; she adopted her new charge, and sat assiduously until they were hatched, the only assistance she required being to have them occasionally turned for her, being unable from their large size to perform that part of her duty. The young birds she fed with egg and soft bread, but what was very remarkable, she several times carried them small worms, a food natural to blackbirds, but totally different from that of canaries, who always feed their young from the crop. It soon, however, became too great an undertaking for the little foster-mother to supply her family with food, they were therefore fed by hand, and appeared to be thriving, but were one very cold night so thoroughly chilled, from the canary being frightened from the nest (probably by a cat), that they did not recover it, and soon after died before they were quite fledged.—*George Fox, Newcastle-on-Tyne.*

Occurrence of Anthus arboreus in February.—On the 14th of February this year I obtained a specimen of the Anthus Arboreus, which is usually supposed to be only a summer visitor.—*H. T. Frere, Aylsham.*

Occurrence of Richard's Pipit near Newcastle.—A fine female of Richard's Pipit

(*Anthus Richardi*), was shot on our Town Moor on the 9th inst.--*Thos. John Bold*; 42, *Bigg Market, Newcastle-on-Tyne*.

Migration of the Swallow.—A swallow was shot close to our house at Exley about a month since, which on being examined, was found to have a piece of parchment fastened to one of its legs with this inscription on it,—“I. Rovina, Barcelona,” and on the reverse, “March 30th, 1845.”—*Francis Richardson*; *Halifax, October 22nd, 1845*.

Anecdote of a Robin.—A robin has lately been amusing himself here after the manner of the wagtails, mentioned in the *Zoologist*, (Zool. 136, 230, 566, 940, &c.) While busy setting some recent entomological captures, my attention was arrested by something dashing against the window of a small room adjoining that in which I sat. Enquiring into the cause of the racket, I observed a male redbreast fly from the window, uttering his notes of anger and defiance. He returned in a few minutes, and dashed furiously against the window glass, striking it with his bill and feet simultaneously; this he repeated several times and then retreated to the top of an adjoining wall, where he sung loud notes of triumph, after which, however, he renewed his imaginary contest, and kept it up at intervals for nearly three days, by which time he had apparently come to the conclusion, either that he had vanquished his foe, or that his efforts were of no avail, as I have seen nothing of him since. The well known pugnacity of the bird, with the peculiar bearing of the individual in question, convinced me that he believed he was combatting another male bird, instead of the reflected image of his own bright eyes and orange breast. The same explanation will scarcely, however, in all instances, apply to the wagtails, as in that mentioned by M. Julien Deby, the bird continued his attacks after the glass was so besmeared with mud, that all reflection was out of the question, still the fresh recollection of the supposed enemy, might have induced the pertinacity of the conflict.—*R. F. Logan*; *Hawthornbrae, Duddingston, Edinburgh, October 14th, 1845*.

Brambling near Ross and anecdote of a Robin.—I yesterday saw two or three specimens of brambling (*Fringilla Montifringilla*), near Pool Cottage, Dewchurch, Herefordshire, the first instance I have observed since I have resided in this county of their appearance in it. The following is an instance of remarkable tameness in a robin; I was sitting in a room with a blazing wood fire, when my attention was attracted by two or three taps at the window opposite the fire-place, which I found were caused by a robin. I opened the window and in a few minutes the bird flew direct into the room, and after surveying the different parts of it, commenced feeding on the flies in the window; I put some crumbs on the floor and he almost directly began to feed on them and then commenced singing; he staid in the room about twenty minutes and then took his departure, having shewn no signs of fear and affording myself and others much pleasure.—*Robert M. Lingwood*; *Lyston, near Ross*.

The Nightingale in Monmouthshire.—Mr. Yarrell in his ‘History of British Birds’ limits the westward range of the nightingale in this country to Barnstaple, in North Devon, and adds that it has not been heard in Wales. I believe that all modern Ornithologists concur in this opinion, but I do not by any means think it impossible that upon further inquiry it will be found erroneous. If true, it is certainly a curious fact, that the bird should confine itself even to the modern arbitrary division of counties, for it certainly is to be found plentifully in Monmouthshire as I know from personal experience, having heard the woods on the banks of the Wye, about Tintern

Abbey resound with its beautiful melody every night for a fortnight last May. It certainly is a singular fact, if it does not step over into Glamorganshire or Brecknockshire; at all events its appearance in Monmouthshire is sufficient to account for its Welsh synonyme, which the author of the article 'Nightingale' in the 'Penny Cyclopædia' is at a loss to explain.—*C. R. Bree; Stowmarket.*

Occurrence of the Great Belted Kingfisher in Ireland.—I am indebted to Mr. Ball, of Dublin, for the information that a specimen of the Great Belted Kingfisher (*Alcedo Alcyon Linn*), has been shot at Annsbrook, in the county Meath. Another specimen of this American bird was seen by Mr. Latouche's gamekeeper at Luggelaw, I shall endeavour to give a figure and full description as soon as practicable.—*Edward Newman.*

Nest and Eggs of Savi's Warbler.—I have been favoured by my correspondent, Mr. Bond with the following description of the nest and eggs of Savi's Warbler, *Salicaria luscinioides* of Temminck and Gould. At the date of the publication of Mr. Yarrell's History of our British Birds, the particulars annexed were unknown. Three nests were found in the summer at Backsbite, in the parish of Milton, between three and four miles north of Cambridge. These nests, in each instance, were on the ground. They are cup-shaped, compactly formed of the long narrow leaves of the common reed, (*Arundo phragmitis*) wound round and interlaced, but without any other lining. The eggs measure ten lines in length, by seven and a half lines in breadth; of a whitish ground colour, covered nearly all over with minute specks of two colours, one set being of a pale red, the other of light ash gray: in some of the eggs the pale red spots are the most conspicuous, and these resemble the eggs of the grasshopper warbler, but are rather larger; in others the gray specks are predominant, and these resemble the eggs of the Dartford Warbler.—*Edward Newman.*

Occurrence of the Oyster Catcher inland.—On the 23rd of March, 1845, I shot the Oyster Catcher (*Hematopus ostralegus*), in the neighbourhood of Guildford on the banks of the River Wey.—*F. A. Chennell; Stoke, near Guildford, November 11th, 1845.*

Incubation of the Ringed Plover (Charadrius hiaticula).—I have often heard and read of this bird exposing its eggs to the sun. I beg leave to offer the result of my observations on this subject. In the spring of 1844, while staying on the Sussex coast I made search for the nest of this bird, I found two with four eggs in each and visited them about noon every day for nearly a week, I invariably found the bird on the nest although the weather was very hot at the time. The parent bird when disturbed on the nest, creeps along the shingle to the water's edge and then flies a short distance uttering its well-known cry. The nest of this bird is merely a hole scratched in the beach, and is lined with pieces of the smallest shingle.—*F. A. Chennell, Stoke, near Guildford, November 11th, 1845.*

Anecdote of Herons fighting.—A curious occurrence happened at Roydon in this county, which perhaps you may think worthy of record in 'The Zoologist.' A boy observed two herons on the ground fighting with one another, he ran up and one flew away apparently unhurt, the other lay still and allowed the boy to pick it up, he took it to the gentleman who informed me of the circumstance, and the bird was examined to see what injury it had received: it was apparently not much the worse and was placed on the lawn to see if it had recovered, which it proved beyond doubt by setting all sail and making off. It is curious that so shy a bird as the heron should have allowed a lad to pick it up unless seriously wounded, and the fact of combats

taking place between them I have never seen noticed before. Perhaps after all it may have lain still, because like Mr. Bury's bird, it preferred the chance of maltreatment from man to a renewal of the fight in the air.—*H. T. Frere ; Aylsham, Nov. 28th, 1845.*

The Spoonbill in Andalusia.—One day last August during a paddle down the Guadalquivir, a river of great charms to the Ornithologist, we came upon a Spoonbill, busily engaged in fishing as it waded in the shallow water under the bank ; its method was to pass its beak sideways through the water, keeping it open till something palatable came within its grasp ; but the action by which it effected this was most singular, for instead of turning only its head and neck, it turned its whole body from left to right and from right to left, like the balance wheel of a watch, its neck stretched out, and its beak immersed perpendicularly to about half its depth ; this semicircular action was kept up with great vigour and at a tolerably quick march. The spoonbill, it appears "snitters with its neb" (I. F. D.) when it is ploughing in soft sand or mud (Zool. 227), but I did not perceive that in the mode adopted by my birds the beak was ever closed until just as it was drawn out of the water, which was not done frequently ; and I think the rapidity with which it was passed through the water would make "snittering" useless, if not impossible. The above-mentioned bird kept before us in short flights for a great distance down the river, till at length we overtook a small flock of the same species which it joined ; these were all fishing in the same manner, and so busy were they, that they would not rise till we were just opposite to them, and they began again the instant they alighted ; the state of the tide was probably that which best suited their operations. Their appearance when thus occupied was so striking as to call the attention of all the people on board, all Spaniards. In flying, the neck as well as the legs are stretched out, and this with the comparative straightness of the wings and their quicker flapping, gives the spoonbill, when in the air, an appearance very different to that of the heron tribe. The same day I saw numbers of curlews and many different sizes of sandpipers, also various gulls, and terns, several kinds of ducks, and one flock of geese, besides birds I could not make out. The common heron was abundant along the banks, and very tame, large hawks like marsh harriers were sailing over the plains. On my voyage up, I had seen one huge black fellow seated in the distance in solitary grandeur, and to my great satisfaction I clearly made out with my glass that he was a vulture ; it was within two or three hours of Seville, and near the vast pastures where the far-famed bulls were rearing for the fight : near there I was informed they were not uncommonly to be seen. On my return, of course I kept a good look out, and great was the excitement with which I saw four or five of these birds rise from the ground, their necks stretched out, and their long rounded wings flapping slowly, until they began to sail in majestic circles, when I watched them for nearly a quarter of an hour without observing a single motion of the wings. Some time afterwards, as we were approaching San Lucar, another got up on the bank almost close to the boat. Their flight is not unlike that of the harriers. I supposed them to be the young of the Egyptian Vulture. I believe I afterwards saw a flock of mature birds in the Bay of Tangier, but they were at some distance. The great bustard is a bird I had always longed to see in its native wilds, a bird whose name now only reminds one of good old times in English natural history ; and this same day my eyes were delighted with the sight of several small herds at a very little distance off ; their bodies appeared longer as they were feeding than I should have thought they would do, four or five that were

close to the water's edge rose as the boat approached, they got up rather hurriedly to some little height and then turned and swooped down gradually, after the manner of gallinaceous birds. About the meaning of the Spanish name *abutarda*, Ford, in his 'Hand-book,' says "it is probably *Iberian*; the Romans catching at sound, not sense, called them *aves tardas*, *quasi* (slow birds), which no one who has ever seen them fly or run, as we have, would do." A Spanish sportsman, of Seville, informed me that two or three months before, they might have been shot in plenty, (off their nests I suppose) perhaps they are slow then. However, the engineer of the steamer, an Irishman, assured me that *abutarda*, in modern Spanish means "slow bird," and he told me the name of some other bird beginning with *abu*, which he also explained, but this meaning in the Latinized state of the language may easily have been superinduced. But I must not occupy your room any further, than to say that I have duplicates of the eggs of the Little Bustard, Bee-eater, Pratincole, and Stilt Plover, which I should be happy to exchange with any of your correspondents for eggs of British birds of equal rarity which may happen to be desiderata to my cabinet. These I brought with me from Barbary.—*J. Wolley; Trinity College, Cambridge.*

Early appearance of the Tufted Duck.—On Saturday, October 13th, 1845, near Worthy on the Ichen, I shot a specimen of the Tufted Duck (*Fuligula cristata*). It was swimming, but rose from the water as I came near. Was not this an early specimen of the bird?—*P. L. Sclater; Hoddington House, near Odiham, Hampshire.*

Extraordinary Feet in a Duck.—When staying a short time since at the house of the Rev. Robert Ellis, of North Grimstone, in this county, he shewed me a duck, or more properly speaking, a drake, the feet of which were not webbed, but were to all appearance, those of a common barn-door fowl; nevertheless, he swam at the head of his progeny with much force and adroitness. Mr. Ellis also informed me that at some other place he had seen a duck which had one foot webbed, and the other not. This specimen of the genus *Anas*, would doubtless be *au fait* at the Horatian recorded game of *par impar*.—*Francis Orpen Morris; Hafferton Vicarage, near Driffield, Yorkshire, October 20th, 1845.*

Singing of Swans.—In 'The Zoologist' (Zool. 1177), I find a remark that the singing swans of the Ancients "must still be accounted as fabulous." Having often listened to their melody with great pleasure, I am inclined to think differently, and feel called upon to act as their champion. In Australia, where the black swan (*Cygnus atratus*) is met with in large flocks, their note is very sweet. In a shallow inlet in Port Stephens, about a hundred miles to the North of Sydney, I have often seen flocks of between (on a moderate computation) two and three thousand, and the notes of the multitude each differing slightly from his neighbours, when carried over the waters to the boat in which we were approaching, were blended together into most harmonious and plaintive music. This was, however, only before they were disturbed. For as soon as the boat came near the sweet melody ceased, and the scene assumed an entirely different aspect. By their song, we could always tell whether the swans were in the bay before their long necks appeared above the line of water. The same note, though in a different key, I have noticed when they have been flying home from their feeding ground. This was generally about sunset, and as their way lay directly over the house in which I was living for some months, I had frequent opportunities of hearing and seeing them. They generally flew in parties of about seven or eight together.—*Robert L. King; Grammar School, Truro, December 5th, 1845.*

Revival of a frozen Frog.—The following fact, which has fallen under my own observation, may possibly throw some light on the common stories we hear about toads, &c. being found in the hearts of trees, and the middle of large blocks of stone. In the winter of 1840, or thereabouts, I found in a large tank, a wretched frog imbedded in the ice which had formed round him to some considerable thickness. I tried to extricate him by breaking the ice, but he proved to be so brittle with the frost, that one of his legs snapped off. When the spring returned, however, our friend revived and swam about minus a leg, “as well as could be expected.”—*L. Hough ; Cotham Hill Villa, West Clifton.*

Eggs of the Flesh-fly deposited in a living Toad.—Last summer, 1845, having noticed a great quantity of dead toads, I was induced to inquire the cause of their death. On the 23rd of August I selected one that seemed unusually inactive: all that I could then see of the disease, after a careful examination, was that one nostril was a little enlarged. I placed the toad in a box inaccessible to small insects, and on opening the box three days afterwards I found the frontal sinuses and fleshy parts of the head devoured by larvæ of the flesh-fly, after eating the whole of the toad, excepting the skin and bones, they changed into the chrysalis state. I did not count the larvæ, but I should say they numbered a hundred.—*F. A. Chennell ; Stoke, near Guildford, November 11th, 1845.*

Disease amongst Fish.—A disease has attacked the pike and eels in the river Barrow during the present season, both being frequently found in a dying state on the surface of the water. The pike seem emaciated, and the inside of the mouth presents a fungous ulceration covering the teeth, palate, and tongue, and when the body is opened, the stomach is filled with a green slimy substance. Eels are seen with little apparent life for a day or so, and afterwards dead in shoal water (the place where all wounded or sick fish swim to), the under part of the body from the mouth to the tail, is speckled with blood-red spots, and the mouth is sometimes full of coagulated blood; however, the fish does not seem to be in bad condition, or to have suffered so long as the pike; the same kinds of fish in the canal about Monaster-Evan have also suffered from the same malady.—*Leinster Express ; September, 1845.*

Spawning of Trout.—In a former number (Zool. 580) I mentioned the fact of the trout in the River Rye, in the North Riding of Yorkshire, being full of spawn of a large size, in the month of March, on the authority of a friend of mine. The same gentleman was there on the 25th of this last September, and found but very few trout at all there, and none of them with either spawn or melt. On his mentioning it to an intelligent farmer there, he at once said, “Oh! Sir, those are all barren fish, and the others are gone up the small becks (streamlets) to spawn.” If this is the case it proves that in that river at any rate, trout continue spawning from September to March; a very long period under any circumstances, for the continuance of a function, the time of which is usually in the lower animals very much more limited. If I can learn any thing further on this subject I will not fail to let you know.—*Beverly R. Morris ; York, October 20th, 1845.*

The Father Lasher's capability of living in fresh water.—A few days since in looking over the first volume of Mr. Yarrell's ‘British Fishes,’ I came across the following.

Speaking of the Father Lasher (*Cottus bubalis*), he says "it will live a long time out of water as has been already noticed; yet, when taken out of the sea, if put into fresh water, it dies instantly." The above appears not to have been the result of Mr. Yarrell's own observations, but to be extracted from 'Loudon's Magazine of Natural History.' While staying at Brighton during the summer of last year, I took several "Rock Dolphins" as they are there called, with a hand line from the Chain Pier, and the following note on one I extract from my journal, "caught a rock dolphin which after being half an hour out of water and seven hours in fresh water is still alive." It did not shew any dislike to the fresh water, and when after the above period had expired I transferred it to some sea water, it took no notice of the change. It died during the night, It appeared to be a sluggish fish, seldom moving, except when disturbed. Immediately I saw Mr. Yarrell's figure of the father lasher, I recognized my old friend the rock dolphin; two of my friends did the same.—George Guyon, Ventnor; Isle of Wight, December 8th, 1845.

Singular mode of catching Eels.—In the hard frosts of last year I saw a method of eel-catching practised which was new to me, and would go far to prove that the hearing of fish is nearly deadened by cold. The eels had come, as they usually do in such cases, to the surface of the water immediately below the ice, and where it was clear, were easily seen. About two or three inches off them, a hole was cut through the ice large enough to admit a pair of nippers, with which the eel was summarily pulled out. Where there were reeds projecting through the ice the concussion carried downwards by any blow on them was sufficient to startle the fish, but where the ice was uninterrupted they usually lay quite still till extracted; I tried the plan myself after watching it for some time, but did not calculate the difference of weight between myself and the boys whom I saw fishing, so that though the hole I broke was large enough in all conscience, it was in a position much more likely to give me as food for the fishes than *vice versa*. I saw only eels taken, but was informed that some perch and tench had also been captured in this singular way.—H. T. Frere, Aylsham.

Carnivorous propensity of common black slug.—A few days ago I caught a large black slug (*Limax ater*), in the act of devouring a common earth-worm, fully one-third of which had disappeared, when I left him to the enjoyment of his morning meal.—T. J. Bold; 42, Bigg Market, Newcastle.

Carnivorous propensity of common Slug.—In my daily walks between Exley and Halifax I have had opportunities of noticing the carnivorous propensities of the common slug. I have twice observed them feeding on dead specimens of the family to which they belong, and once I watched one for nearly a quarter of an hour making a meal of a large worm.—Francis Richardson; Halifax, October 22nd, 1845.

Irish locality for Amphipectea involuta.—This very beautiful little shell, so well known for its rarity, I had the satisfaction of taking in abundance, in September last, in the only locality in which it has hitherto been found in the United Kingdom. It was first discovered in Ireland by Mr. Harvey, of Limerick, and was subsequently taken by Mr. Thompson of Belfast, Mr. R. Ball of Dublin, and others, but always in exceedingly small quantities. It probably occurs in many of the lakes so common on the Kerry mountains; nevertheless, it is a singular fact that it has not ever been observed in any other than the original locality. During a recent visit at Killarney I examined

very diligently many of the other alpine lakes in hopes of finding it, but could not discover the smallest trace of its existence in any of them. The only locality hitherto known is a remote lake on a mountain called Cromaglaun. Following up the new Kenmare road, at the distance of about six miles from Killarney, you arrive at the foot, and unless the proper path be strictly adhered to, you may expect a regular scramble ere you reach the top, on which the lake is situated. That this is a fact I can speak from *experience*; for having once had the guardianship of a large party to the summit, in our over-anxiety to reach the scene of action, we left the beaten track in order to steer our course straight up to the lake, the consequence of which, was, we never reached our destination at all; for after a couple of hours, uninterrupted climbing over rocks, trees, bogs, and streams, finding the attempt utterly hopeless, we were compelled out of respect to our own safety, to descend to the spot from whence we started! On my first visit I captured about ninety specimens, but the generality of them were so exceedingly minute as to be scarcely larger than an ordinary pin's-head. A few, however, were more bulky, although none so large as a series lately shewn me at Dublin by Mr. Ball, or as Mr. Harvey's specimens, one of which, Mr. Thompson of Belfast describes as being " $5\frac{1}{2}$ lines in length, and $3\frac{1}{2}$ in breadth."—*T. V. Wollaston; Jesus College, Cambridge, November 14th, 1845.*

*Some account of Gonoplax Rhomboides.**—Dr. Milne Edwards, in the second volume of his Natural History of Crustaceans, (p. 62) has given a short description of a species of Gonoplax, of which the specific character is, that it is destitute of spines on the external margin of the shield or carapace, close behind the external angles of the orbits. But of the distinction of this from the only other known species of this genus (*G. angulata*), a doubt was entertained by Latreille; who supposed that it was nothing more than a variety; in which opinion he is joined by Mr. Bell, in his beautiful work on Crustaceans, now in the course of publication. And this doubt would appear to be not without reason, if we are guided by the names and references which Dr. Milne Edwards has placed at the bottom of his page. I have no opportunity of consulting the authors there quoted; but some of the specific names are so strikingly inappropriate to this species as I have seen it, that it becomes clear, that some mystery hangs over the subject; and we are left to the choice of the following conclusions:—*First*, that there are other species, yet to be distinguished: *Secondly*, that the *G. rhomboides* has been confounded with its congener in one or other of its sexes, or in some stage of its growth: or *Thirdly*, if they be in reality one species, that a portion of its history is obscure, and that it is more variable in its form, proportions, and armature at different ages beyond early youth, than any others of our crustaceans are known to be. The length of the carapace, including the anterior process, beneath and on the sides of which the eyestalks are inserted, of the specimen of *G. rhomboides* under examination, is six lines, the breadth eleven lines; and this is, I believe, about the size they usually attain. But the distinctions between these crabs, considered as species, will be best expressed by a comparison between them. In doing this, however, I prefer giving a reference to the figure by Pennant (*Cancer angulatus*,

* Read before the Natural History Society of Penzance, December 2nd.

vol. iv. pl. 5. f. 10), rather than to that by Mr. Bell; because the latter, though I have no doubt correct to the specimen, appears not to express adult proportions; but implies at some more advanced period of its growth, a sudden lateral expansion. The arms, however, are of the full dimensions; and the spines and straightness of the anterior border of the carapace, are expressive of the species. My specimen of *G. angulatus* measures $1\frac{1}{2}$ inch across, and $\frac{3}{4}$ of an inch in length; which is very nearly the proportion of Pennant's figure; and in this specimen the anterior limb measures rather more than four inches in length. At that portion of the carapace which in *G. angulatus* forms the strong advancing spine that affords the specific designation of Pennant, in *G. rhomboides* there is only a gentle curvature, that makes no approach to the nature of a spine; and there is no appearance of that second lateral spine, of which in its congener there is always a rudiment; and from which Dr. Leach seems to have derived his name, *G. bispinosa*; but which is too powerfully given on the right margin of Pennant's figure. This hinder spine is somewhat strangely omitted on the left side of his specimen. The eye-stalks are more curved, as is also the margin of the carapace that conceals them, than in undoubted specimens of *G. angulatus*; and as they lie hid, the joint is anterior to the ocular portion: a circumstance which induced me, in the Cornish Fauna, to place this species in the genus *Gelasimus*, under the name of *G. Bellii*; in honour of the professor of Natural History in King's College. My past observations of this species having been confined to female specimens, a greater degree of uncertainty has formerly prevailed in my mind concerning this crab; either as regards the distinction of species, or the progress of evolution of its form; for while in a male *G. angulatus* of the dimensions already given, the arms are four inches in length, it is known that the same parts in the female are very much shorter, as well as more feeble, a rule which, indeed applies to all the species of crustaceans. But my present account is derived from an undoubted male specimen of *G. rhomboides*; in which I find their length to be proportionally much shorter than in the kindred species; and their appearance to bear a closer resemblance to the same parts in the female in the other. On the arm, where in *G. angulatus* there is a spine, in this there is a very slight mark of a point; and a portion of the carpus is only membranous: although this last may be a defect confined to the individual. In the interior lengthened portions of the smaller legs of *G. angulatus*, there is on the superior ridge, where it is about to terminate in the tarsus, a small, but well-marked spine; which in the present species is absent, the place being marked by a depression, followed by a rising. Mr. Bell, in his description, says that in the young male of *G. angulatus*, the arms resemble those of the female; and from this circumstance it may be objected that one of the most distinguishing marks of this as a species, will be of less importance. In all other cases, however, I have found that when the flap or tail has distinctly assumed the male form, all the other organs have also adopted their permanent condition. The margin of the carapace may at least be judged to have done so; and yet this, in so large a specimen, preserves the well marked distinction from the other. If then, the *Gonoplax rhomboides* be allowed to be a distinct species, it must be claimed as scarcely a rare inhabitant of the channel, where the present specimen must have lived at the depth of thirty-six or forty fathoms. If it be otherwise decided, there is room for further research, to discover the progress and proportions of its development; and whence it happens that it observes a law so very different from that of other British crabs. I have generally failed in obtaining good specimens; for though *G. angulatus* has sometimes come within my reach alive and uninjured, I

have only seen this from the stomach of fishes; where usually it has sustained some injury, and most commonly the loss of some of the limbs.—*Jonathan Couch; Polperro, November, 1845.*

Exotic Spiders imported in dye-wood, &c.—I have before me two beautiful spiders, of the genus *Mygale*, which I obtained in September last in the hold of a vessel laden with log-wood from St. Domingo. They measure upwards of three inches, in extreme length, and the span of the fourth pair of legs is nearly six inches. The colours are very beautiful; the thorax is a rich carmine, and the legs a fine purple, the abdomen nearly black, covered with a thick down, interspersed with longer hairs, which are grayish at the extremities. The legs are very hairy, and armed with numerous sharp spines, which the creatures have the power of erecting, in order to grasp their prey more firmly. I kept one alive for upwards of a month, when it died. It eat a cockroach one night, leaving merely fragments of skin rolled together in a ball of web. Afterwards, though supplied with cockroaches, flies, and other insects, it could not be induced to feed. Its movements were not rapid, but very graceful, walking on its "tiptoes" as it were. The hooks at the end of the tarsi were retractile, and when lying back, completely concealed by the tufts of hair. Several species of tropical Arachnida, &c., and occasionally snakes, are found in the dye-wood vessels, concealed in the clefts of the wood, I found in the same ship a fine specimen of *Theliponus caudatus*, (*Lat.*) which survived a few days, and was very savage, and two real Tarantulas (*Phryni*), which when I took them out of the box, I found fastened on a poor spider; in the fight for which, they had unfortunately each lost one of the remarkable antenna-like anterior tarsi.—*George Wolley; 9, Cambridge Street, Liverpool, December 2nd, 1845.*

Remarkable habits of an Australian Spider.—In the middle of last April I was particularly struck with the singular habits of a spider, which had constructed his web between a high fence and the gable end of my house; these being about ten yards from each other, and the web being about midway between them. As soon as the web was finished the spider procured a leaf, and having rolled it up into the form of an extinguisher, he fixed it in the very centre of the web with the point upwards. In this domicile he remained at rest until some prey was entangled in the web, when he immediately pounced upon it and conveyed it into his mansion to be devoured. Whether the object of this singular contrivance was protection from the weather or concealment from his prey, or both combined, I am unable to say, but it struck me as very ingenious. Had the domicile been placed at the extremity of the lines the spider would have had at least five yards of line to traverse before reaching the centre of the web, and of course the same distance to return with his prey. One wet and windy night spider and all disappeared. The perusal of 'The Zoologist' as it arrives serves to "whet my almost blunted purpose" of collecting insects and contributing to its pages.—*Alfred Lambert; 249, Pitt Street, Sydney, June 20th, 1845.*

[I need scarcely remark on the pleasure it gave me to receive a contribution from a gentleman, who during his residence in this country was one of our best and most accurate observers. His papers in 'The Entomologist' will be remembered with pleasure by all my subscribers, but he left England almost immediately after the recommencement of the work under its present title, having contributed only two short papers to its pages (Zool. 35 and 95).—*E. Newman.*]

Gordius aquaticus, supposed to fall from the atmosphere with rain.—The appearance of the *Gordius aquaticus*, or hair-worm immediately after showers, has frequently fallen under my notice, and has, in common with the views of some other persons, produced in my mind the opinion, that they fall from the atmosphere in conjunction with rain. This opinion is confirmed almost to demonstration by the fact, that within the last few months, three individuals of this species have been taken from situations considerably above the surface of the ground and immediately after the fall of rain. Two were found in a holly-bush, and one oddly enough had caught upon a piece of stick that was suspended horizontally in a friend's garden. A similar case is on record in the 'Magazine of Natural History', but only on newspaper authority. For the truth of the above facts I will vouch.—*Edwin Brown; Burton-on-Trent.*

Capture of Lepidopterous Insects near Manchester.—Since my communication to 'The Zoologist' (Zool. 1007), I have captured the following species in this district: the rough weather during the latter part of the season, was very unfavourable for collecting, especially on the moors, where, unless it is fine, insects are difficult to find, and generally shattered specimens:—

- Anacamptis tricolorella, April, Dunham Park, oaks, rare
- Glæa rubricosa, April, Prestwich woods, willows, abundant
- Lampropteryx badiata, April, Prestwich Woods, willows, scarce
- Anacamptis longicornis, May, Chat Moss, heath, abundant
- betulea, May, Chat Moss, heath, abundant
- Heribeia Haworthella, May, White Moss, heath, scarce
- Amaurosetia cerusella, May, White Moss, heath, scarce
- Phycita fusca, May, White Moss, heath, abundant
- Macrochila bicostella, June, White Moss, heath, abundant
- Dasycera sulphurella, June, Cheetham Hill, decayed oaks, abundant
- Argyromyces mespilella, June, Cheetham Hill, oaks, scarce
- tristrigella, June, Cheetham Hill, oaks, scarce
- Pseudotomia atomargana June, Cheetham Hill, oaks, abundant
- Anacamptis rhombella, June, Cheetham Hill, oaks, abundant
- Hadena adusta, June, Cheetham Hill, willows, &c., scarce
- Anchylopera derasana, June, Saddleworth Moors, heath, scarce
- Acronycta Menyanthedis, June, Saddleworth Moors, heath, scarce
- Hadena glauca, June, Saddleworth Moors, heath, scarce
- Eupithecia angustata, June, Saddleworth Moors, heath, abundant
- Melitæa Artemis, June, Stockport, pasture-fields, abundant
- Argyrolepis Baumanniana, June, Stockport, pasture-fields, abundant
- Ederesa mendicella, June, Chat Moss, heath, rare
- Aphelosetia cygnipennella, June, Stockport, pastures, scarce
- Lozopera straminea, June, Stockport, pastures, scarce
- Anacamptis diffinis, June, Stockport, pastures, abundant
- Spilonota strœmiana, June, Stockport, pastures, scarce
- Scopula pulveralis, June, Stockport, pastures, scarce
- Tortrix Viburnana, June, Stockport, pastures, scarce
- Hadena dentina, June, Saddleworth Moors, stone-walls, scarce

- Microsetia stipella*, June, Saddleworth Moors, heath, scarce
Anticlea sociana, June, Cheetham Hill, oaks, uncommon
Gracillaria stigmatella, June, Cheetham Hill, oaks, uncommon
Porrectaria leucapennella, June, Cheetham Hill, swampy fields, abundant
Microsetia guttella, June, Cheetham Hill, swampy fields, rare
Lophopteryx Camelina, June, Dunham, oaks, abundant
Ptycholoma Lechiana, June, Dunham, oaks, abundant
Anacamptis atra, June, Chat Moss, oaks, scarce
Hipparchia Davus, June, Chat Moss, oaks, heath, abundant
Aspilates respersaria, June, Chat Moss, heath, abundant
Acidalia fumata, June, Chat Moss, heath, abundant
Cnephasia resinella, June, Chat Moss, fir-trees, scarce
Setina mesomella, June, Chat Moss, heath, scarce
Lithosia complana, June, Chat Moss, birch-trees, rare
Anarta Myrtili, June, Chat Moss, heath, abundant
Bupalus favillacearius, June, Chat Moss, heath, scarce
Tortrix coniferana (*Ratzburgh*), June, Chat Moss, fir-trees, very rare
Anacamptis aterrima (*Dale*), June, Chat Moss, heath, rare
Anticlea bilunana, June, Chat Moss, oaks, abundant
 — subocellana, June, Chat Moss, oaks, abundant
Polypogon nemoralis, June, Chat Moss, grass, rare
Xerene albicillata, July, Chat Moss, birch-trees, scarce
Drepana falcataria, July, Chat Moss, birch-trees, scarce
 — lacertula, July, Chat Moss, birch-trees, scarce
Acidalia inornata, July, Chat Moss, grass, rare
Emmelesia sylvata, July, Chat Moss, birch-trees, scarce
Euthemonia russula, July, Chat Moss, heath, scarce
Larentia imbutata, July, Chat Moss, heath, scarce
Microsetia Pfeifferella, July, Pendlebury, grass, scarce
Pterophorus migadactylus, July, Pendlebury, grass, scarce
 — fuscodactylus, July, Pendlebury, grass, scarce
Anticlea nigromaculana, July, Kersall Moor, ragwort-flowers, rare
Emmelesia heparata, July, Chat Moss, beating, abundant
 — luteata, July, Chat Moss, beating, abundant
Phycita palumbella, July, Chat Moss, heath, scarce
Hyria auroraria, July, Chat Moss, heath, common
Tortrix galeana, July, Chat Moss, heath, scarce
Mamestra Pisi, July, Chat Moss, heath, scarce
Polia herbida, July, Chat Moss, oaks, scarce
Nemeophila Plantaginis, July, Chat Moss, heath, scarce
Argyrosetia Brockella, Gædartella (one species), July, Chat Moss, oaks, abundant
Aplocera cæsiata, July, Brushes, stone-walls, abundant
Harpalyce galiata, July, Brushes, stone-walls, rare
Electra testata, July, Brushes, heath, abundant
 — populata, July, Brushes, heath, uncommon
Lozotænia Forsterana, July, Brushes, heath, uncommon
Orthotænia Bentleyana, July, Chat Moss, heath, abundant
Amphisia Gerningiana, July, Chat Moss, heath, rare

Eupæcilia angustana, July, Chat Moss, heath, in great abundance
Orthotania subsequana, August, Saddleworth Moors, heath, rare
Ablabia quadripunctana, August, Saddleworth Moors, heath, abundant
Apamea nictitans, August, Cheetham Hill, ragwort-flowers, abundant
Gortyna micacea, August, Cheetham Hill, ragwort-flowers, abundant
Caradrina cubicularis, August, Cheetham Hill, ragwort-flowers, abundant
Miana literosa, August, Cheetham Hill, ragwort-flowers, scarce
Agrotis fumosa, (black variety) August, Cheetham Hill, ragwort-flowers, scarce
 ——— *valligera*, August, New Brighton, ragwort-flowers, abundant
 ——— *aquilina*, August, New Brighton, ragwort-flowers, abundant
 ——— *cursoria*, August, New Brighton, ragwort-flowers, scarce
Actebia præcox, August, New Brighton, ragwort-flowers, scarce
Miana humeralis, August, New Brighton, ragwort-flowers, scarce
Heliophobus popularis, September, New Brighton, grass, scarce
Scopula sticticalis, September, New Brighton, grass, very rare
Steganoptycha triquetra, September, New Brighton, grass, very rare
Phibalapteryx lineolata, September, New Brighton, grass, very rare
Hama testacea, September, Cheetham Hill, hedges, in great abundance
Lithomia solidaginis, September, Brushes, stone-walls, in great abundance
Polia Chi, September, Brushes, stone-walls, scarce
Oporabia filigrammaria, variety, September, Brushes, stone-walls, scarce
Charæas graminis, September, Saddleworth Moors, ragwort-flowers, abundant
Celæna Haworthii, September, Saddleworth Moors, ragwort-flowers, scarce
Caradrina glareosa, September, Brushes, stone-walls, rare
Cidaria latentaria, September, Brushes, stone-walls, rare
Pyrophila tragopoginis, September, Withington, sugar, scarce.

My friend, Mr. John Thomas captured a female specimen of *Ægeria Spheceiformis*, hovering over "Sweet Gale" in Lord Francis Egerton's wood on Chat Moss, the 6th of July. In varieties the following species have fallen to my lot, *Euthemonia Russula*, male, brilliant specimen, the ear-shaped stigma on superior wings of a fiery scarlet, instead of dark red and brown, a female specimen occurred on the same day with the head and jaws of the caterpillar firmly attached to the thorax in place of the usual appendages, in other respects the insect is quite perfect. *Hyria auroraria*, in southern counties, assumes the form of colouring so beautifully figured by Mr. Curtis, but this is a rare variety in this part, the majority of specimens being entirely pink with a faint yellow stigma: I took a specimen this season in fine condition, one of the superior wings from the base to the middle being drab, and the remainder pink. *Vanessa Atalanta*, has been abundant for the last two years, I have met with but a single variety out of some thousand specimens, and this is a male with a very narrow transverse orange band on the superior wings interrupted with black, into five divisions. *Hipparchia Hyperanthus* is exceedingly variable in the number and form of the ocelli, I captured a male without ocelli. *Hipparchia Davus* occurred in abundance this season: a beautiful illustration of the effects of draining as regards this species, occurs on Chat Moss; part of the Moss where this insect is found has been cross-drained for three years, specimens taken in this part have decreased considerably in size, are darker specimens, and have larger ocelli. *Agrotis aquilina*: although pretty well accustomed to varieties, this is the most variable insect I am acquainted with, the size, colour, markings, and form of the wings are dissimilar; it is almost impossible to meet with two specimens

alike; it occurs in great profusion at New Brighton, near Liverpool. I captured near here a beautiful specimen of *Rumia cratægata*, measuring two inches across the wings.—*R. S. Edleston; Cheetham, Manchester, October 31st, 1845.*

Capture of Lepidoptera, 1845.—*Clisiocampa castrensis*. Bred August 20th, from larvæ found on the sea-wormwood, St. Osyth, Essex, July 3—10.

Fumea nitidella. Bred June 30th from pupæ, found on fir-trees at Black Park.

Agrotis Agathina. One on the flowers of *Calluna vulgaris*, or common ling, at West Wickham, September 14th, worn.

Mythimna turca. June 26—30, Black Park, at sugar.

Segetia neglecta. September 9th, one on flowers of *Calluna vulgaris*, West Wickham.

Glæa rubiginæa. October 26, one, at sugar, Norbury Park, Surrey.

Xylina semibrunnea. October 25, one, at sugar, Norbury Park, Surrey.

Apamea Ophiogramma. July 19—31, among willows, flying, near the Kent Road.

Euthalia Psittacata. October 26, flying at night, and on ivy, Norbury Park.

Scotosia rhamnata and *vetulata*. July 14, Sanderstead, out of hedges by beating.

Pachynemia Hippocastanaria. August 24—September 14, on heath-flowers, at night.

Chesias Spartiata. October 21, Coombe Warren, on broom.

—— *obliquaria*. May 18, Coombe Warren, on broom.

Thera variata and *simulata*. September 14, Wickham, fir-trees.

Eupithecia togata. June 26—30, Black Park, in spruce-firs.

Minoa Euphorbiata. August 17, Wickham, flying. This insect also appears in June.

Margaritia hyalinalis. July 20, Sanderstead, hedges by beating.

Tortrix galeana. July 27, bred from a larva found on sea-wormwood, St. Osyth, July 9.

Lozotenia cinnamomeana. June 26, Black Park, by beating.

—— *roborana*. July 3—10, Ardley Wood, Essex, by beating.

Antithesia Gentianana. July 18, Charlton sandpit, sweeping.

Spilonota tetragonana. July 3—10, Ardley Wood, Essex, by beating.

—— *nigricostana*. July 27, Sanderstead, by beating.

Pseudotomia sequana. June 15—20, Croydon, old railway.

—— *simpliciana*. June 1—15, Croydon, old railway.

—— *populana*. September 7, Wickham, by beating.

Capua ochraceana. May 28, Dulwich Wood, by beating hedges.

Argyrolepis Margaritaria. July 18, Charlton sandpit, sweeping.

Phoxopterus nigro-maculana. July 24, Charlton sandpit, sweeping.

Depressaria umbellana. October 21, Coombe Wood, in furze.

Anacamptis nebulea. April 12—30, Jerry's Hill, Putney Heath, flying at dusk.

—— *rhombella*. June 9, Dulwich, beating hedges.

—— *tricolorella*. July 26, Coombe Hurst, Croydon, out of hedges.

—— *bifasciella*. August 15, Champion Hill, Dulwich, hedges.

—— *interruptella*. August 17—23, Dulwich Wood, on furze, at night.

Panalaria Leuenhoekella. June 15, Sanderstead, among herbage.

—— *Merianella*. July 17—24, Wickham, among heath.

Astyages grandipennis. August 24, one, Wickham, among heath.

Metallosetia Spissicornis. July 18, Charlton sandpit, sweeping.

Batia Lambdella. June 19, Charlton sandpit, sweeping.

Phycita nebulella. July 18, Charlton sandpit, sweeping.

—— *bistriga*. June 26—30, one, Black Park.

—— *abietella*. June 26—30, Black Park, on firs,

Homæosoma gemina. June 19, Charlton sandpit, in grass.

Araxes ahenella. June 15, Croydon, old railway, in grass.

Crambus pygmæus and *cerusellus*. June 15, Croydon, old railway, in grass. I believe these to be but sexes of one species.

Crambus tristis. June 15, Croydon, old railway, in grass.

Adactylus Bennettii. July 3—10, two, among grass on the sea-wall, St. Osyth's, Essex, taken at dusk.

Pterophorus microdactylus. June 19, Charlton sandpit, sweeping.

The above, with those previously published (*Zool.* 1089) are my best captures this year. I could have added many others, but thought it better not to occupy space that may be better employed, and have therefore noted only the rarer species captured. This season has not been very productive of specimens, but many of the rarer species have been taken by different persons, particularly in the summer months. In the spring there was a great scarcity, caused partly by the continued cold weather, and partly by the destruction of larvæ by birds and drought the preceding summer. The autumn moths too, have been unusually scarce, caused, I have little doubt, by the cold, wet summer, having caused great quantities of caterpillars to perish. I was at Norbury Park, from the 25th to the 28th instant, and did not see one moth, where in former years I have seen fifty, and a collector residing near that place told me it has been the same throughout the autumn.—*J. W. Douglas*; 6, *Grenville Terrace*, Kent Road, October 30th, 1845.

Proposed mode of recording the dates of the appearance of Lepidopterous Insects.—It had frequently occurred to me that the seasons for the appearance of insect in the imago state are loosely given in books on Entomology, owing to the circumstance that there was no ready method known of putting such observations on record. I accordingly set myself to work to devise a plan which might supply this desideratum. My plan being submitted to Sir Oswald Mosley, Bart., met with his approval, and he in the most spirited manner had a great quantity of sheets beautifully lithographed in the required form for the use of naturalists at his own expense. I proceed to give you a description of the scheme. Each sheet is divided into fourteen columns by strong perpendicular lines; the extreme one on the left to contain the names of the insects, that on the right for casual observations, and the twelve intermediate ones are each devoted to one of the calendar months beginning with January. Every one of these is again subdivided by faint lines into three minor columns appropriated to the average period of ten days; from right to left are ruled strong lines bounding the spaces devoted to the respective species, and these divisions are again divided by faint lines into six lesser spaces. To make use of these sheets it is necessary after having written the specific names of that class of insects intended to be studied in the first column; to fix upon a scale of colours to represent the various localities in which the respective species are found. The one I framed for my own use in recording the seasons of Lepidopterous insects is the following:—

Woods and Forests.....Green.

Gardens and Hedgerows.....Pink.

Upland Pastures and Heaths ... Brown.

Meadows.....Yellow.
 Water.....Blue.
 HousesRed.

These six colours correspond in number to the six transverse spaces opposite to each specific name, and the manner in which I would recommend the plan to be brought into practice is this; viz., at the end of every ten days, say on the 1st, 10th, and 20th of each month the naturalist should review his captures, and having rubbed a little of all six colours on a palette, with a camel-hair pencil proceed to touch the spaces in the proper column for the ten preceding days, and opposite to the names of the respective species with one or two more colours, accordingly as the species are found in one or more kinds of localities. This, if repeated at the end of every ten days throughout the year will produce an invaluable record, available for many purposes. As a guide in future years for field operations it will be exceedingly useful, inasmuch as it will be only necessary on any given day to pass the eye down the column proper for that date, to see by the streaks of colour intersecting it, what species the entomologist may hope to meet with, and what localities will prove most productive. In the course of time, when a great number of observers shall have accumulated observations on some such plan as this, it would be indeed a treasure to have a set of sheets *printed in colours* embracing the observations of naturalists in all parts of the country, and giving a complete view of the seasonal appearances of our Fauna. I enclose you a specimen-sheet filled up in colours. The periodical posting-up of this ledger of nature would involve but little labour to those who are constantly in pursuit of insects, and I am enabled by the accustomed liberality of Sir Oswald Mosley to place a set or two at the service of any naturalist who is willing to undertake the task of keeping accounts for Dame Nature, and who will apply to me, indicating at the same time the channel through which he wishes them to be sent. The plan is obviously adapted equally well for the registration of the period of flowering of plants. When bound up these sheets form a handsome oblong-folio volume.—*Edwin Brown; Burton-on-Trent.*

Flowers which are particularly attractive to Moths.—Some interesting remarks have appeared in 'The Zoologist' (Zool. 1088), in reply to Mr. Hepburn's inquiries respecting the flowers most attractive to "the pretty rovers of the night," as he pleasingly designates the nocturnal Lepidoptera. And as the subject is one of much interest, I beg to send you the result of my own observations in a locality much nearer to the inquirer. Beginning with those which I have not yet seen noticed as attractive, I shall mention. The *Barberry*, the golden blossoms of which are remarkably attractive to *Hadena plebeia*, and from which I have also obtained *Rusina ferruginea* and *Xylophasia rurea*. The *Raspberry*, which is very attractive while it lasts, and is visited by *Polia advena*, *Xylophasia rurea* and *combusta*, *Plusia chrysitis*, &c. The *Pansy*, an especial favourite with the genus *Plusia*: *P. Iota*, *P. percontationis*, *P. Gamma*, *P. chrysitis*, and *P. festucae*, have been my captures from it, and it is remarkable that it is almost entirely neglected by the other Noctuidæ. The common *Sage* is very attractive in some seasons, more especially to *Polia advena* and *Plusia Gamma*. The *Pink* is also an attractive flower, as are also the *Privet* and *single Stock*. The *Candied tuft* has been noticed by Mr. Gaze. Among other moths which I have taken from it during the past season may be mentioned *Graphiphora renigera*, *G. C-nigrum*, and *Caradrina plantaginis*. Some other annuals, as *Phacelia tanacetifolia* and *Gilia aggregata*, are also very attractive when sown in masses. From the *Sweet William* I have taken

Deilephila porcellus and *Mythimna conigera*. The *Lime*, *Honeysuckle*, and *Jasmine* possess their usual attractions. The Ivy, I am afraid will be of little use in this part of the country, it is so late in coming into flower.—*R. F. Logan* ; *Hawthornbrae, Duddingston, near Edinburgh.*

Occurrence of Lasiocampa Trifolii near the Land's-End.—Having seen in 'The Zoologist' notices of the capture of rare moths, I beg to inform you that during the last summer I took five larvæ of *Lasiocampa Trifolii*, two of which I reared, the others died ; the two which I reared produced a male and female, the former I have in my possession, the other I sent to a friend. I reside on the borders of the Atlantic, within a few miles of the Land's-End, a district altogether unexplored by Entomologists. If a list of the rarer moths, &c. of this district will be acceptable to 'The Zoologist, I will gladly make out such a list and forward it to you.—*William Noye* ; *St. Just, near Penwith, November 26th, 1845.*

[A list with correct names, also dates and localities will be most acceptable.—*Edward Newman.*]

Remarks on the occurrence of Lasiocampa Trifolii, near Manchester.—In 'The Zoologist' for November (Zool. 1140), I observe an account of the capture of *Lasiocampa Trifolii*, near Manchester. I cannot allow this statement to pass unnoticed : in the first place we have *no coast* near Manchester, the nearest point is Liverpool, more than thirty miles distant, the locality your correspondent so vaguely alludes to, Lytham is *forty-five miles* distant. Entomologists require to know *where*, and not *near where*, in stating localities. How any person can trace the slightest similarity between the cocoons of *L. Trifolii* and *L. Rubi*, I am at a loss to imagine, no two objects are more unlike ; that of *L. Rubi* is a long cylindrical bag tapering at each end, of so loose a texture the chrysalis can be seen through it. *Trifolii* is of an oblong shape, yellow, and glutinous texture, attached to its situation by means of beautiful white silken threads ; *Quercus* is much larger, more elongated, dark brown colour, and exceedingly firm coriaceous texture, smooth on the outside, generally attached by coarse threads, rarely loose upon the moss.—*R. S. Edleston* ; *Manchester.*

Australian Caterpillar and Parasite.—I have recently found some larvæ exactly resembling those of *Orgyia antiqua*. I have also discovered that the female moth like that of *O. antiqua* is apterous, as I have met with its body on the web on which the eggs were deposited. But the remarkable part of the history is the way in which the larvæ are ichneumonized. Having met with a brood about two-thirds grown, I was just going to remove them from the twigs on which I found them, when I discovered that some of them adhered closely to the twig : on examination, this turned out to be caused in the following manner ; each caterpillar so adhering had been infested by a single ichneumon larva which had escaped from the skin of the caterpillar on the under-side and spun a cocoon immediately beneath it, the skin of the caterpillar being stretched over the parasite's cocoon, preserved exactly the size, form, and colour of life. I am preserving the whole of the specimens for you, and shall take an early opportunity of sending them. Rest assured that I shall send you also a lot of memoranda which will convince you old associations are not forgotten.—*Alfred Lambert* ; *249, Pitt Street, Sydney, June 20th, 1845.*

Acronycta Alni.—I have a fine specimen of this moth : I found the caterpillar in a small plantation of alders, near Hastings, in August, 1842. It changed to the pupa state in rotten bark on the 13th, and emerged as the perfect insect, June 14th, 1843.—*G. A. Thrupp* ; *1, Hyde Park Place, West, London, November 6th, 1845.*

Description of the larva of Orthosia opima.—Having seen no description of the larva of the *Orthosia opima* in any Entomological work, I beg to inform you that I was fortunate enough to rear a brood of them this season. The imago is taken in this neighbourhood, chiefly on moist grounds feeding on the blossoms of the willow, from the middle to the end of April. In its early stages the larva is quite green, but having changed its skin several times, gradually becomes darker; and when fully grown assumes an olive-brownish tint; down the centre of the back is a broad olive longitudinal band. On each side of which is a paler stripe, which is again followed by a brown-olive stripe running along the spiracles; below this is the ordinary pale yellowish-green lateral stripe, deepening to a bright green beneath. The caterpillars were nocturnal feeders, and during the day time remained secreted beneath the leaves of their food. Many larvæ I find are carnivorous, but these appear to feed in perfect harmony; they attained a somewhat larger size than the caterpillars of the *Orthosia instabilis*, a brood of which I reared at the same time, and they have all formed cells just beneath the surface of the soil in my breeding-box. I have captured this year a few specimens of *Mamestra suasa*. The greater bulk that were captured in Doncaster were taken by means of sugar on a row of elms in marshy ground within a few feet of the river-side. On the willow-blossoms, I took this spring many fine specimens of *Orthosia populeti*. Fabr.—*A. I. Evans; Hall Gate, Doncaster.*

[Mr. Evans has omitted to inform us on what this larva feeds.—*Edward Newman.*]

Acidalia aversata and *A. remutata*, varieties of one species.—I have succeeded in proving that *Acidalia aversata* and *A. remutata* are but one species. On July 27th, 1844, I took a female *aversata* which deposited some eggs, these hatched August 3rd following. Not knowing what they fed on, I put different plants to them, of which they selected *Galium verum*, on which they fed till about the middle of September, when they had reached about one-third of their size; they then ceased to feed, and it was evident they would hibernate in the larva state. To have two chances, I kept some in the breeding-cage, and others I exposed to the weather, but under cover: of the latter only one survived the winter, while of the former, seven (I think the whole number) lived. Early in May they began to eat again, and appeared to feed on different kinds of food, but on nothing until it was quite withered. They were full-fed on June 2nd, 1845, and, making a web of a few threads on the moss, passed into the pupa state, and the perfect insect appeared June 28th. Of the seven, three were *aversata*, and four *remutata*.—*William Turner; Uppingham, Rutlandshire.*

Varieties of Miselia Oxyacanthæ.—It is generally understood that there are two very dissimilar varieties of *Miselia Oxyacanthæ*, one a rich brown with darker clouds, and green only on the strigæ; the other, what I may call the common variety; and for what I know, these varieties may have been proved to be but one species, if not it may interest some entomologists to know that I have bred both varieties from the eggs of the same moth. They were deposited September 28th, 1844, hatched April 10th, 1845, full-fed June 2nd, and the perfect insect appeared September 25th, they fed on crab-tree, black and white thorn. The pupa was enclosed in a hard egg-shaped cocoon under ground. If larvæ are made the basis of classification, it is strange that this moth should be in the same genus with *Miselia Aprilina*, for nothing can be much more unlike than the larvæ of the two. I know not the larva of any other of the genus. If such information as I may gain about the private history of moths is likely to do you any service, I will endeavour to communicate it from time to time.—*William Turner; Uppingham, Rutlandshire.*

Larva of Acronycta Alni.—Having observed a communication in 'The Zoologist' (Zool. 1140), respecting the larva of *Acronycta Alni*, I beg to offer you the following observations. In August, 1843, a fine larva of this moth being given to me, I immediately placed it in my breeding-box; the next morning it had disappeared, and I saw no more of it until June 8th, 1844, when I had the finest and most beautifully marked male specimen I ever saw. This individual had not formed a cocoon of dried leaves, but had penetrated more than an inch into the loose soil contained in the box, and there formed its cell. This year I again found three of these beautiful larvæ, the first on August 17th, crawling on an old gate-post beneath an oak-tree; I gave it a variety of food, but it refused to eat, and in a few days I had the mortification to find various sized maggots in place of my larvæ, of which the skin was laid open without the slightest vestige of inside remaining. The evening before these destroyers made their appearance, the larva was moving about quite lively. The fact of caterpillars retaining the powers of locomotion, &c. as in this case, after the whole, or nearly so, of the muscular portions have been consumed is truly wonderful. The other two specimens were found on August 27th and September 4th, both on the ground. They were supplied with many kinds of leaves, including ash and birch, but they both refused, and after shedding the whole of their curious spines, apparently from some disease, both died.—*John R. Hawley; Hall Gate, Doncaster.*

Larvæ of Odontopera bidentata.—The number of larvæ of *Odontopera bidentata* which have made their appearance here this autumn has been quite unprecedented. The wet and chilly weather, so injurious in its effects on some larvæ, seems to have been rather favourable to these. When returning from mothing last night, I counted no less than twenty-four by the light of the lamp, upon a jasmine-bush in front of the house; their appearance being very singular, hanging by their pro-legs from the twigs in all directions. They are not to be seen during the day,—concealing themselves in the withered leaves next the wall; their colour is very variable, some being ferruginous brown, some nearly black, while others are cream-coloured with delicate chequered markings.—*R. F. Logan; Hawthorn Brae, Duddingston, near Edinburgh, September 10th, 1845.*

Capture of Peroneæ or Buttons at Hainault Forest.—It has long been the practice of entomologists at the close of the season to take a journey of nearly a hundred miles to the New Forest in Hampshire, that being the most celebrated locality for the capture of this most interesting genus of insects: it now appears that nearly all the species may be taken within twelve miles of London. The following were taken in Hainault Forest by Mr. Bouchard, Mr. Hindley, and myself:—*P. cristana*, *P. alboflammana*, *P. albovittana*, *P. subvittana*, *P. Desfontainiana*, *P. fulvovittana*, *P. semiustana*, *P. brunnea*, *P. spadiceana*, *P. striana*, *P. subcrystalana*, *P. unicolorana* (*Desv.*), *P. Chantana*, *P. profanana*.—*H. J. Harding, 1, York Street, Church Street, Shoreditch.*

Pseudotomia atromargana and strobilella.—These insects which have hitherto been recorded as two species are but the sexes of one. My brothers and I captured a large number of them in Hyde Park, in May last, several amongst them in copulâ. I think the larvæ feed under the bark of the oak-trees, as a great number of small dark pupa cases were found protruding from the bark of the trees at the same time the moths were captured.—*Henry Longley; 1, Eaton Place, North Row, Park Street, Grosvenor Square.*

Capture of Lepidoptera at Lewisham.—*Agrotis radia*, September, 1, one attracted by light

Episema ceruleocephala, September 3, one attracted by light.

Larentia cervinata, October 3, one attracted by light.

————— October 23, one attracted by light.

Orthosia pistacina, abundant, at sugar, October 12—31.

———— *lota*, upwards of sixty specimens, at sugar, October 12—31.

Miselia Oxyacanthæ, abundant, at sugar, October 12—31. I took one of the brown variety on the 15th.

Glæa Vaccinii, common, at sugar, October 13—31.

———— *subnigra*, abundant, at sugar, October 15—31.

———— *satellitæ*, six specimens, at sugar, October 15—31.

Phlogophora meticulosa, common, at sugar, October 20—31.

Calocampa exoleta, one at sugar, October 20.

Polia flavocincta, one at sugar, October 20.

Agrotis suffusa, one at sugar, October 26.

Hypena rostralis, common, at sugar, October 15—31.

Petasia cassinea, one attracted by light, October 31, very fine.

I had little or no success with sugar here throughout the summer; but since the 12th of October the noctuæ have been very plentiful. I find that a sweetened fir-bough is far more attractive than several trunks of trees sweetened. *O. lota*, *G. satellitæ*, *C. exoleta*, and *P. flavocincta*, with many of the others, were taken at sugar on the fir-foliage.—*H. T. Stainton; Lewisham.*

Capture of Lepidoptera on the Downs, near Godstone Road.—On the 13th of September I paid my last visit this season to that locality, where I expect to reap a rich harvest next summer. I met with *Acontia luctuosa*, one, *Polyommatus Agestis*, *P. Adonis*, male only, *Pamphila Comma*, one, much faded, and a worn specimen of *Macrocampa marginella*. A fine female *P. Corydon* was taken by Mr. Wild, who accompanied me.—*H. T. Stainton; Lewisham.*

Capture of Lepidoptera in Scotland.—*Gortyna Petasitidis*, one, September 1st, near Carron, flying at half-past seven, p.m.

Caradrina glareosa, Boyd's Planting, September 2, one; Carron, September 4, one; Dunoon, September 20, one.

Leucania pygma, Carron, September 4; Latham Moss, September 10, fifteen; Dunoon, September 21, seven; Torwood, September 23, sixteen.

Orthosia litura, Carron, September 9—18, common, at sugar.

Celæna Haworthii, Latham Moss, September 10, one; Kilmun, September 21, two, on the top of the hill.

Polia Chi, Dunoon, two, flying at dusk, September 12.

Charæas graminis, Dunoon, September 7, one; Kilmun, one, September 21.

Euthalia psittacata, Dunoon, September 10, one.

Miselia Aprilina, Torwood, September 23, two, on trees resting, and two, at sugar; October 11, one, at sugar. This insect was common there, in 1843, but last year not a single specimen was taken.

Xanthia rufina, Torwood, September 23, at sugar, plentiful.

Spilota Strömiana, Torwood, September 23, three, among bushes.

Chelaria rhomboidella, September 23, one, among bushes.

Glyphisia emargana, Torwood, September 23, one, and several near Carron.

Calocampa vetusta, Carron, September 24, one; October 2, one; Torwood, October 18, three; Carron, October 2 and 22, three.

Glæa satellitia, Boyd's Planting, September 8, three, at sugar; Torwood, October 11 and 18, abundant.

Glæa Vaccinii, Torwood, abundant.

Calocampa exoleta, Carron, October 14, one; October 15, one; October 17, one; Torwood, October 18, six; Carron, October 22 and 24, six.

Miselia Oxyacanthæ, Carron and Torwood, at sugar, October 11—30.

Agrotis suffusa, Carron, October 31, one, at sugar.

Orgyia antiqua, several of the chrysalis taken at Latham Moss, September 10. The perfect insect is much larger and finer than southern specimens.

The larvæ of *Phragmatobia fuliginosa* and *Anarta Myrtili* were common at Dunoon in September, the former on ragwort, the latter on heath. *Lasiocampa Quercus* and *Rubi* were plentiful on heather. Several of *Acronycta Rumicis* were taken off bramble; and one of *Pygæra Bucephala* off sallow.—*H. T. Stainton; Lewisham.*

Capture of rare Moths, near Lyndhurst in the New Forest.—The wet and stormy weather that has prevailed since July has injured most of our captures. I have failed to secure a single quite perfect specimen of *Margaritia flavalis*, which though usually accounted scarce, may be taken abundantly on the downs here during the month of August. But a friend of mine has taken the following moths from sugar placed upon trunks of trees near Lyndhurst, in the New Forest, which I select from the list as worthy of being recorded an account of their rarity:—

August 7.	<i>Cerigo cytherea</i> .
—— 26.	<i>Apamea nictitans</i> , abundantly.
——	<i>Segetia neglecta</i> .
—— 30.	<i>Caradrina glareosa</i> .
Sept. 8.	<i>Ceratopacha diluta</i> , several.
—— 22.	<i>Orthosia litura</i> .
Oct. 6.	<i>Chæræa nigra</i> .
—— 9.	<i>Mecoptera satellitia</i> .
——	<i>Orthosia lota</i> , several.
——	<i>Orthosia macilenta</i> .
——	<i>Miselia oxyacanthæ</i> , several.
——	<i>Xylina Lambda</i> , several.

The same friend also took the following in the same locality during the month of July:—*Cleora bajularia*, *Fidonia ericetaria*, *Charissa obscuraria*, *Lobophora sexalisata*, *Leptogramma squamana*, *Lozotænia corylana*.—*J. F. Dawson; Ventnor, Isle of Wight.*

Insects feeding on Mineral substances. By the REV. G. MUNFORD.

IN 'The Zoologist' for last April you did me the favour to admit a communication relative to the unusual circumstance of insects feeding on mineral substances; I had hoped that some one of your numerous readers would, ere this, have noticed my letter, but this not being the case, I beg once more to recur to the subject.

I know indeed that it is the opinion of naturalists in general, as expressed by Professor Jones, that it is "One of the most incontrovertible facts with which we are acquainted, that the mineral kingdom does not furnish food for the support of animals."

It is, however, difficult to say what is an *incontrovertible fact* in nature, till naturalists can be said to be *perfectly* acquainted with *all* the habits and economy of every animal that falls under their observation; and to this degree of knowledge no one, I suppose, will be bold enough to lay claim.

Another instance of an animal feeding on a mineral substance has occurred to my mind, since writing my former letter; and as it appears in some measure confirmatory of the fact therein related, I beg to mention it, in the hope that some discussion on the subject may be elicited in the pages of your interesting periodical.

The rank or position which the sponges occupy in the scale of nature is, it is true, still a matter of dispute; for while many distinguished naturalists contend for their animal organization, others equally eminent affirm, that they differ in no essential character from vegetables. Those, however, who consider them to be of an animal nature,—although zoophytes and occupying the lowest form of animal life,—will hardly be able to deny, that that life is supported, at least in a very great degree by mineral substance, as neither the vegetable nor animal kingdom appears to furnish any part of its subsistence. “Nothing more seems necessary to their sustenance and growth” (says Dr. George Johnston in his ‘History of British Sponges’) “than the admittance of the circumfluent water, since like plants, they appear to live solely on water and its mineral ingredients.”

No great stress can indeed be laid upon this instance, from the nature of the being whose mode of subsistence is here adduced; all those who do not admit its animalization, will of course consider the argument as of no force.

A circumstance, however which fell under the notice of an eminent naturalist more than twenty years ago, and with which I very recently became acquainted, will be considered worthy of attention.

There is a letter in the 61st volume of the ‘Philosophical Magazine and Journal’ entitled ‘On animals receiving their nutriment from mineral substance; by the Rev. W. Kirby, M.A., F.R.S., F.L.S.’ I do not find that this letter attracted much observation at the time, at least I see no mention of it in other volumes to which I have access; and as the work may not be of easy reference to all, I beg to enclose a copy of Mr. Kirby’s communication.

Barham, January 16th, 1823.

“To the Editor of ‘The Philosophical Magazine and Journal.’

“Gentlemen,—Mirbel has proposed to distinguish vegetables from animals by the different nature of their food; the former deriving their nutriment, as he affirms, from inorganic matter, and the latter from organic. Another able and learned physiologist, Dr. Virey, in the ‘Nouveau Dictionnaire d’Histoire Naturelle,’ article, ‘Aliment,’ maintains on the contrary, that plants as well as animals, are supported by organic food; since as he contends, it is the debris of organized matter, mixed with the soil, that furnishes plants with their appropriate pabulum, as likewise those animals, such as earth-worms, the larvæ of ephemeræ, &c. which have been supposed to live upon earth. He also excludes water and air from the functions in question. The arguments which he adduces in support of his hypothesis appear ingenious and forcible: the principle one is that the fertility of a soil depends upon the quantity of *humus* or vegetable earth that it contains; and that worms, &c. are not to be found in very barren soil. Still, however, there is no general rule without some exceptions: and one has fallen under my own notice, which seems to prove that there are animals that can derive nutriment from mineral substance, in which there is no debris of organized mat-

ter. When I was lately in town, Mr. Hunneman, of Queen Street, Soho, informed me that he had received some specimens of asbestos from Professor Bonelli, which upon examination were found to contain many larvæ of some insects, that had perforated it in various directions, and in it underwent their customary metamorphosis. These when arrived at their perfect state, proved to be a species of the genus *Dermestes*,—a tribe that usually feeds upon dead animal matter when dried. He obligingly gave me specimens of the beetles, and also of the asbestos, the latter appeared to be of the flexible kind, which is called amianth. Upon examining the former, I find it to be the *Dermestes vulpinus* Fabr. (Oliv. Ins. No. 9. t. 1. f. 6), a species common to South Europe and South Africa. As the animals of this tribe are not particular in selecting a place in which to undergo their metamorphosis, it is not probable that they would have taken the trouble to perforate the asbestos for the sole purpose, since they will not only assume the pupa in the exuviae of the animal they have devoured, but even under their own excrement (see De Geer, iv. 196); but a further proof that this was not their object is furnished by the varying size of the holes perforated in the specimen of the amianth that Mr. Hunneman gave me. There were three, one of which was a line and a half in diameter; another a line and three-fourths; and a third two lines; from whence it seems to follow that the insects that perforated it were in different stages of growth, and consequently derived nutriment from that substance.

“I hope that the fact I have here recorded will not be unworthy a place in the ‘Philosophical Magazine,’ and that it may stimulate some of your readers, who may have had an opportunity of making observations on similar subjects, to lay them before the public. Insulated facts, though seemingly trifling, are often of great use to the physiologist and natural philosopher.

“I am, yours, &c.,

W. KIRBY.”

P.S. Since forwarding you my paper on ‘Animals feeding on Mineral substances,’ a day or two ago, I have met with the following instances which you will oblige me by inserting. I have not Kirby and Spence nor Macleay by me, but as you doubtless have, perhaps you will trouble yourself to turn to the references.

The larva of *Callidium bajulus* feeds upon lead, often perforating spouts and roofs; the lead has been found in its stomach, (see ‘Kirby’s and Spence’s Introduction to Entomology,’ vol i. p. 235, and ‘Macleay, *Horæ Entomologicæ*,’ vol. ii. p. 193.)

Macleay gives I think several instances; still I think it may be admitted in general that no member of the animal kingdom is ever maintained or nourished for any great length of time by inorganized substances, though a few, as common salt, may be used as a condiment to the organized substances.—*George Munford; East Winch, November 10th, 1845.*

Additional note on Tetrastichus.—In ‘The Zoologist’ (Zool. 1158), I mentioned a species of *Tetrastichus* whose larva destroys *Yponomeuta Euvonymella*. It is the *Eulophus Euvonymellæ* of Bouché (*Naturgeschichte der Ins.* i. 172, 68). Its assumption of the perfect state continued from the early part of August till near the middle of October, during which time about forty individuals, nearly all of them females were disclosed. The eggs whence they sprung were probably laid much later in the year than those of the parasites before-mentioned.—*Francis Walker.*

NATURALISTS' CALENDAR FOR FEBRUARY.

BIRDS—In this month many species of birds which have remained during the winter in flocks, pair, and disperse themselves over the country to their breeding stations. The raven and stock-dove are among the earliest breeders, and frequently have eggs, and occasionally young, about the latter end of the month. In many species a remarkable change of plumage takes place: the common linnet (*Linota cannabina*) is a familiar example; this bird, at this season, exchanges the dull browpish purple of the head and breast for the most brilliant carmine, and towards the end of the month is mostly in full nuptial plumage; but this change is not so evident in birds of the preceding year as in older individuals, and it is not till the second or third season that the bird acquires the full brilliancy of his plumage. The stonechat (*Saxicola rubicola*) and the reed bunting (*Emberiza Schanichus*) lose the brown edgings of the feathers of the head and throat, and these parts appear of a perfect black. The pied and grey wagtails (*Motacillæ Yarellii* and *Boarula*) are beginning to assume the nuptial dress, and their throats exhibit a mixture of black and white feathers; a few individuals may be found at the end of the month in full summer plumage.

INSECTS.—During this month the oak beauty moth (*Biston prodromarius*) and *Hibernia progemmaria* appear, and may be found on the trunks of trees, palings, &c. in the day time. Specimens of the green carpet moth (*Euthalia coraciaria*) which have hybernated, may be met with. This is, perhaps, the only British *Geometra* that survives the winter in the perfect state. The herald moth (*Gonoptera Libatrix*) may often be found in a torpid state in houses and outbuildings. This species retires early in autumn, and seldom revives till April or May. Specimens of *Gleæ Vaccinii*, *Spadiacea*, and *Satellitæ*, which appear in the autumn, and live through the winter, often come out in mild evenings.—*Henry Doubleday in Naturalist's Almanack for 1845.*

Naturalist's Almanack for 1846.—I regret to see that this pretty little Almanack should this year be so replete with blunders. It states that the Gray Wagtail, White Wagtail, Brambling, and Yellow Wagtail appear in January; that the House Martin arrives in March; that the Hedge Warbler arrives, Glowworms shine, and Game Certificates expire in April; that Swallows congregate in July: in October it treats of the Mountain Finch and Brambling as distinct birds. The botanical part is still worse; the Honeysuckle is made to blossom in January; the Elder in February; and so forth.—*Edward Newman.*

The Wasp insectivorous.—Last year I happened to be watching a common large Tipula which was about alighting on a leaf in the garden, when a wasp flying up seized him as a hawk would a small bird, or a dragon-fly an insect, and almost in an instant had made an end of him; I came to the rescue, but it was already too late.—*F. O. Morris; Hafferton, near Driffield, November 7th, 1845.*

Parasitism of Chalcidites.—In noticing a single species of the Chalcidites, it seems advisable to mention its place in the large group to which it belongs. Of all this tribe

Trichogramma evanescens has the most imperfect structure, the least character, and the greatest affinity with the inferior species of other tribes, especially with the *Mymarites*. It has been reared by Mr. Curtis from the leaves of *Aquilegia*. Then comes the genus *Pteroptrix*, which though few in species, comprises several divisions, out of which may be formed nearly as many genera. Hence we have two divisions, one leading to *Tetrastichus* and *Entedon*, and the other tetramerous *Chalcidites*; the other to the pentamerous species through *Coccophagus* and *Aphelinus*. *Coccophagus scutellaris* and *C. impeditus* destroy the species of *Coccus*. *Aphelinus Chaonia* is parasitic on *Aphis*, and I have observed it infesting the aphides of the peach and of the rose.—*Francis Walker; Grove Cottage, Southgate.*

Economy of the Selandria Cerasi.—At the end of September I observed several slug-worms, the grubs of *Selandria* (*Blennocampa*) *Cerasi*, feeding on the leaves of plum and pear-trees. It is supposed to have been introduced into America from Europe, and the following account of its habits is extracted from Dr. Harris's 'Insects of Massachusetts.' "As my own observations on this insect agree perfectly with those of Professor Peck, in the following remarks I have merely abridged and condensed his 'Natural History of the Slug-worm,' a work now out of print, and rarely to be met with. In the year 1828, I observed these saw-flies, on cherry and plum-trees, in Milton, on the 10th of May; but they usually appear towards the end of May or early in June. Soon afterwards some of them begin to lay their eggs, and all of them finish this business and disappear within the space of three weeks. Their eggs are placed, singly, within little semicircular incisions through the skin of the leaf, and generally on the lower side of it. The flies have not the timidity of many other insects, and are not easily disturbed while laying their eggs. On the fourteenth day afterwards the eggs begin to hatch, and the young slug-worms continue to come forth from the 5th of June to the 20th of July, according as the flies have appeared early or late in the spring. At first the slugs are white; but a slimy matter soon oozes out of their skin and covers their backs with an olive-coloured sticky coat. They have twenty very short legs, or a pair under each segment of the body except the fourth and the last. The largest slugs are about nine-twentieths of an inch in length, when fully grown. The head, of a dark chestnut colour, is small, and is entirely concealed under the fore-part of the body. They are largest before, and taper behind, and in form somewhat resemble minute tadpoles. They have the faculty of swelling out the fore-part of the body, and generally rest with the tail a little turned up. They live mostly on the upper side of the leaves of the pear and cherry-trees, and eat away the substance thereof, leaving only the veins and the skin beneath untouched. Sometimes twenty or thirty of them may be seen on a single leaf; and in the year 1797, they were so abundant in some parts of Massachusetts, that small trees were covered with them, and the foliage entirely destroyed; and even the air, by passing through the trees, became charged with a very disagreeable and sickening odour, given out by these slimy creatures. The trees attacked by them are forced to throw out new leaves, during the heat of the summer, at the ends of the twigs and branches that still remain alive; and this unseasonable foliage, which should not have appeared till the next spring, exhausts the vigour of the trees, and cuts off the prospect of fruit. The slug-worms come to their growth in twenty-six days, during which period they cast their skin five times. Frequently, as soon as the skin is shed, they are seen feeding upon it; but they never touch the last coat, which remains stretched out upon the leaf. After this is cast off, they no longer retain their slimy appearance and olive colour, but have a clean yellow

skin, entirely free from viscidty. They change also in form, and become proportionally longer; and their head and the marks between the rings are plainly to be seen. In a few hours after this change, they leave the trees, and, having crept or fallen to the ground, they burrow to the depth of from one inch to three or four inches, according to the nature of the soil. By moving their body, the earth around them becomes pressed equally on all sides, and an oblong oval cavity is thus formed, and is afterwards lined with a sticky and glossy substance, to which the grains of earth closely adhere. Within these little earthy shells or cocoons the change to chrysalids takes place; and, in sixteen days after the descent of the slug-worms, they finish their transformations, break open their cells, and crawl to the surface of the ground, where they appear in the fly-form. These flies usually come forth between the middle of July and the first of August, and lay their eggs for a second brood of slug-worms. The latter come to their growth, and go into the ground, in September and October, and remain there till the following spring, when they are changed to flies, and leave their winter quarters. It seems that all of them, however, do not finish their transformations at this time; some are found to remain unchanged in the ground till the following year; so that, if all the last hatch in any one year should happen to be destroyed, enough, from a former brood, would still remain in the earth to continue the species. Mice and other burrowing animals destroy many of them in their cocoons, and it is probable that birds also prey upon them when on the trees, both in the slug and the winged states. Professor Peck has described a minute ichneumon fly, stated by Mr. Westwood to be a species of *Encyrtus*, that stings the eggs of the slug-fly, and deposits in each one a single egg of her own. From this, in due time, a little maggot is hatched, which lives in the shell of the slug-fly's egg, devours the contents, and afterwards is changed to a chrysalis, and then to a fly like its parent. Professor Peck found that great numbers of the eggs of the slug-fly, especially of the second hatch were rendered abortive by this atom of existence."—*Francis Walker; Grove Cottage, Southgate.*

Note on a species of Platygaster.—It appears by the following extract from Dr. Harris's 'Insects of Massachusetts,' that some species of this genus, like those of *Myrmar* and *Telenomus*, lay their eggs in the eggs of *Lepidoptera*. Mr. E. C. Herrick of New Haven, Connecticut, has made the interesting discovery that the eggs of the canker-worm-moth (*Anisopteryx vernata*) are pierced by a tiny four-winged fly, a species of *Platygaster*, which goes from egg to egg, and drops in each of them, one of her own eggs. Sometimes every canker-worm in a cluster, will be found to have been thus punctured and seeded for a future harvest of the *Platygaster*. The young of this *Platygaster* is an exceedingly minute maggot, hatched within the canker-worm egg, the shell of which, though only one-thirtieth of an inch long, serves for its habitation, and the contents for its food, till it is fully grown; after which it becomes a chrysalis within the same shell, and in due time comes out a *Platygaster*-fly, like its parent. This last transformation, Mr. Herrick found to take place towards the end of June, from eggs laid in November of the year before, and he thinks that the flies continue alive through the summer, till the appearance of the canker-worm-moths in the autumn affords them the opportunity of laying their eggs for another brood.—*Francis Walker; Grove Cottage, Southgate, October, 1845.*

Note on Pteromalus puparum.—This insect appears to have two generations in the space of a year, one requiring nine months (from September to July) to attain perfection, the other three months (from July to September). It is found throughout Europe from North to South, and is also common in Canada and the United States.

Dr. Harris says that it lays its eggs on the caterpillars of butterflies, but I believe that it more often pierces the chrysalis while yet soft.—*Francis Walker ; Grove Cottage, Southgate, December, 1845.*

Distribution of the species of Harpalus and Ophonus.—In the neighbourhood of Leicester we find but four species in all, of the genera Harpalus and Ophonus ; which, considering there are no less than sixty-three recorded as indigenous to Britain, seems to indicate a strange deficiency in some of the local circumstances favourable to their existence. * The species are Harpalus limbatus, æneus and ruficornis, and Ophonus punctatissimus, and of these H. limbatus and O. punctatissimus are rare and local ; the latter shewing also, a great *deterioration* in the size and condition of the individuals. The causes of this are to be sought I think, chiefly in the nature of the soil of the district ; which,—excepting in the immediate neighbourhood of the sienitic rocks of Charnwood Forest, where, being the powderings of those old, weather-worn cliffs, it is light and sandy—consists of stiff clayey earth and the marls of the new red-sandstone. The Geodephaga are peculiarly the creatures of the soil, and are influenced by it perhaps more than any other tribe of insects. Here, in the winter they are unable to burrow or find a genial abode for their hybernation in the earth, and the peculiar species that do flourish here, as the Agona and other damp-lovers, retire to the bark and roots of willows. On the light sandy and chalky soils of the South of England the Harpali and Ophoni have their metropolis : last May, during eight days research in the Isle of Wight, I took at least twenty distinct species of these two genera, which number has been much increased by the Rev. Mr. Dawson of Ventnor, and they were the commonest insects. The most conspicuous were Harpalus serripes, tardus, anxius, thoracicus, cupreus, azureus, rubripes, marginellus, fulvipes, annulicornis and Ophonus obscurus, nitidulus, azureus, punctatissimus and puncticollis. The Harpali are very sensitive of cold, the gentleman above-named notices that on colder days, even in August and September, they burrow to the depth of several inches in the sand. The proximity of the sea, I think is not a cause of any great influence in the distribution of these insects, as I am told there exist but three species even in the neighbourhood of Newcastle, and the neighbourhood of Hertford in a cultivated country appears to be almost as rich as the broken, rough and sunbaked shores of Dover and the South coast of the Isle of Wight. The distribution of insects in Britain, and the laws which govern it have certainly not been much studied with us, although it is true that our Island forms but a northern portion of a greater Zoological province, yet the relative peculiarity of the productions of the south from those of the north, will perhaps hereafter be found to be much greater than was suspected. The fashion has been almost universally, to append a list of localities to a species without any distinction between its rarity in one place and abundance in another, or inquiry how far different local circumstances affect its habit or condition. A species is originally discovered, prolific for instance, in the low country of the “Bedford level.” Afterwards a few individuals may be taken in Norfolk, Suffolk, or the “London district,” or a starved specimen in Wales or Scotland. These habitats are then strung together without any distinction, and the purposes of science are not served. Entomology may supply facts towards generalizations on the subject of geographical distribution of great importance to science at large, and such researches are pursued on the continent with some fruits, if we may judge from Dr. Erichson’s report in his ‘Archiv.’ (Translated and published by the Ray Society.)—*H. Walter Bates ; Leicester, November 19th, 1845.*

Capture of Coleoptera in the North of England.

Dromius fasciatus. Inhabits the sand-banks on the sea-coast near Whitby, where I met with it in September last. My friend Mr. Hardy took it last year in Berwickshire, by sweeping the herbage.

Clivina collaris. I found this insect rather abundant beneath stones, by the Irthing side in Cumberland, last June; many of the specimens have the dark patch on the elytra as figured by Curtis. I also occasionally pick up a stray specimen on the banks of the Tyne.

Helobia nivalis. This species I find in great abundance beneath stones close to the Derwent-edge; I also found it equally abundant in similar situations by the Irthing in June. In common with many of the Peryphi, it does not hesitate, but plunges into the water when hard-pressed, swimming with considerable ease, but more frequently concealing itself beneath the surface.

Anchomenus oblongus. I took a few specimens under the bark of willows in winter; Mr. Hardy finds it in abundance beneath moss in damp woods, in spring.

Platyderus ruficollis. With us a rare and very local species; I met with it on the coast near South Shields early in spring, inhabiting a patch of loose stones, and scags only a few yards in length.

Blenus paludosus. I have this season picked up at various times some half-dozen or so of this species, all of which differ a good deal from Mr. Stephens' description, being generally of a much paler hue, perhaps the result of immaturity?

Ocys melanocephalus. Sparingly during the winter months in rotten willow stumps.

Peryphus concinnus. This species has only occurred on the banks of the Tyne. In 1844 I met with it in some abundance beneath large stones on a shelving bank of about a dozen yards in length. This season I again found it in the same place, but in greatly diminished numbers.

Peryphus saxatilis. In abundance both by the Tyne and Derwent-side, being found early in spring and throughout the summer: it prefers hot sunny banks and lurks beneath the small gravelly stones common in such localities. I have taken many examples of an insect similar in shape. It is, however larger, has pale legs, and the elytra are suffused with reddish-brown, more or less tinged with bluish-green.

Peryphus lunatus. A large and conspicuous species, captured on the banks of the Irthing in June last. This species does not lurk so much under stones as many of its congeners. I found them running about with much briskness in damp, shady places contiguous to the river.

Peryphus decorus? I received an abundance of this insect from Boldon in the summer of 1844, but have not since fallen in with it.

Peryphus vividianus. Occasionally met with by the Ouse and Tyne; I found it rather common by the Derwent in June. It frequents the same locality as *Bembidium paludosum*. (Zool. 1093).

Peryphus cnemerythrus. Found in great abundance in the bed of almost every river or brook that I have searched, many of the smaller specimens are truly beautiful, being tinted with various shades of green, blue, and black. Its habitat is near the water-edge, indeed much nearer than any other species that I have noticed; it also displays much less hesitation in plunging into that element.

Peryphus agilis. A scarce species with us, I do not remember having captured more than three or four individuals. It seems to be more abundant farther north, as Mr. Hardy took a great many specimens in Berwickshire.

Tachypus striatus. I was much pleased to find this elegant insect rambling about on the banks of the Derwent, in the sunshine of a fine day in the middle of April; it inhabits the same locality as *Peryphus saxatilis*. I have since taken a single specimen by the side of the Ouse.

Haliplus elevatus. Common amongst the gravel in the Ouse; I also had it in plenty from Baldon. I have frequently observed this species to simulate death when seized.

Haliplus obliquus. A widely distributed species; I found it in Cumberland, and have also met with in plenty in ponds near Marsden.

Hygrotus fluviatilis. Occurs in profusion (throughout the year) amongst the gravel in the Ouse and Derwent; I have also received it in great plenty from Baldon.

Hydroporus Frater. Plentiful in the ponds of the Magnesian limestone district near Marsden.

Hydroporus latus. I captured a few specimens of this species in the Ouse during the summer of 1844; Mr. Hardy has since taken it in abundance in Berwickshire.

Hydroporus alpinus. Common in the Ouse and Derwent, I also found it in the Irthing.

Hydroporus Davisii. I find this fine species sparingly in the Derwent, where in common with *H. alpinus* it inhabits the gravelly bottom of the stream.

Gyrinus marinus. I have found this to be a widely distributed species, having found it at Baldon Flats, in pools near the coast, and in the Ouse. Mr. Hardy has this season found it in abundance on Prestwick Carr.

Gyrinus lineatus. This large and brilliant insect has only occurred in the Ouse; where I captured some dozens soon after day-light one morning early in April.

Orectocheilus villosus. I captured a fine series of this local species in the Ouse one evening in September, 1844, since which I have not been able to meet with it. Can this be owing to its being a nocturnal species, as I see it is mentioned as such in the 'Review of the Progress of Zoology and Botany,' lately published by the Ray Society, p. 169? Or 'can they have been swept from their usual locale by the many floods of the season?'—*Thomas John Bold*; 42, Bigg Market, Newcastle-on-Tyne, November 25th, 1845.

Occurrence of Melolontha Hippocastani in Ireland.—During a recent visit in Ireland, a pair of this insect was given me by my friend Mr. Clear of Cork, captured at Bandon in the south of the county, where it appears he has been in the habit for several years past of taking annually a few specimens. Being in many respects extremely like the common *Melolontha vulgaris*, it is not improbable it may have been often overlooked. Nevertheless, when observed, the characters are remarkably distinct. The narrow black margin to the elytra, testaceous thorax, short terminal style of the abdomen, and smaller size, at once distinguish it from the common species. Unless I am mistaken, the only record of its having occurred in the United Kingdom is one contained in the 'Entomologia Edinensis,' and subsequently noticed in Mr. Stephens' 'Manual,' where it is stated to have been "captured some years ago by Mr. Wilson on the banks of Windermere."—*T. Vernon Wollaston*; *Jesus College, Cambridge*, November 7th, 1845.

Exhibition of strength in the larva of one of the Staphylinites.—Few things in nature are more surprising than the immense amount of strength with which the diminutive muscles of insects are endowed. I was fortunate enough to witness a feat of this kind

a short time ago in the case of a coleopterous insect. Walking one evening in my garden, my attention was arrested by an earthworm upon the surface of the soil, twisting itself from side to side in a strange unwonted manner, I immediately saw that something was wrong with the poor animal, and that it was in fact in the agony of death, but from what cause I did not at first discover; presently a little black larva about half-an-inch long, which had been couched quietly near the worm, ran to it and bit it near the head; this had the effect of increasing the agonized writhing of the worm. The same thing was repeated several times until the motions of the dying animal became less violent. The aggressor then commenced a survey of the surrounding ground, prying into every little hole within a circle of nine or ten inches radius, sometimes disappearing entirely underneath the surface for a few moments, at length it appeared to have found one every way suitable to its purposes situated a short distance from its victim. The larva then commenced dragging the worm head-foremost towards the hole, but a small lump of earth lay between these, and to have dragged the worm round this would have materially increased the resistance: the difficulty it overcame by laying fast hold of the worm with its mandibles some little distance from the head and *lifting it over* the obstacle; the body being now nearly in a straight line with the hole, it again seized hold of the head and dragged it by little and little until it came to the mouth of the hole (an old worm burrow), it then commenced pulling it in, until all but about half-an-inch of the worm had disappeared under ground, which was in about a quarter of an hour from my first seeing them. When it had got to this point of the operation I dug up both the destroyer and its victim, and carried them forthwith to an accurate balance, where they were weighed, and the worm was found to weigh eighteen grains, the larva *not quite one*. There are in this fact two things worthy of notice; the amazing strength of the larva, which was as if one man were to drag eighteen or twenty others all tied together for the distance of a hundred yards over broken ground; and the proof of rationality it exhibited, for what could it be but the faculty of reason which directed its actions when surveying the ground with all the care of an experienced general. If to reason be to compare ideas, then most assuredly the larva reasoned when it sought for a hole wherein to conceal its prey. It did not *decide* until it met with a cavity, its idea of the fitness of which (including length, width, and easy access) accorded with its preconceived idea of the requirements of the disabled worm. How strange it is that human vanity can so blind the judgment as to lead men to deny to animals the possession of the same faculty with themselves, when the most positive proofs of the affirmative meet us every day. The larva appears to me to be that of some species of *Staphylinus*; it is entirely black excepting the tips of the short antennæ, is about half-an-inch long, and furnished with a very formidable pair of mandibles. I enclose it for your inspection and opinion.—*Edwin Brown; Burton-on-Trent.*

Note on the species of Haltica.—*Haltica concinna*, a small jumping beetle which sometimes abounds on the rhubarb, also attacks the turnip, but it is not so destructive as the turnip-flea, (*Haltica nemorum*). The turnip, the sea-cale, the cauliflower, and the cabbage are subject to the ravages of a third species, *Haltica Lepidii*. Dr. Harris in his 'Insects of Massachusetts injurious to vegetation,' mentions three other species (*H. pubescens*, *H. striolata*, and *H. chalybea*) that are equally injurious to gardens in the United States.—*F. Walker; Grove Cottage, Southgate, October, 1845.*

Occurrence of Haltica consobrina in the Isle of Wight.—I met with this insect in some plenty during last October on the plants of Brassica in my garden. It has

hitherto been unique in Mr. Curtis's cabinet. It is about one line in length, black; above, greenish or blackish green, deeply punctured; thorax narrowed in front; antennæ black, the fourth and fifth joints thickened in the male; fifth joint much elongated in the female; sixth small, following ones broader and compressed, giving them altogether a very stout and robust appearance, which immediately distinguish it from Lepidii and others without the aid of a glass.—*J. F. Dawson; Ventnor, Isle of Wight, December 30th, 1845.*

Treatment of Coleoptera when captured.—Mr. Douglas (Zool. 1042), has given a few hints as to the manner in which insects ought to be mounted for the cabinet, and I hope my brother entomologists will profit by those hints. But, besides the cruelty of sticking good insects with pins like skewers, slanting in all directions, I have a few remarks to offer on their treatment when first captured and while they are yet alive. That their sensibility to suffering is less acute than that of the higher order of animals, probably in exact ratio to the inferior grade they occupy in creation, is not to be denied; but that they are totally incapable of *any* feeling whatever, is an idea which cannot for a moment be entertained; and yet some persons treat them as if they believed that such were the fact. During an entomological ramble last summer, I met a gentleman similarly engaged with myself, who produced a box, and exhibited to me his spoils; in that box were a number of beetles *impaled alive on pins*, writhing and struggling (I say) in agony. Now I do not for a moment believe that he intended wantonly to inflict torture on his poor victims; it was no doubt the result of thoughtlessness on his part, but such a practice may lead to a disregard to the feelings of inferior animals. We have no right to inflict an unnecessary amount of pain on any of God's creatures, and therefore I would suggest to such collectors (probably young hands) who have been in the habit of pinning their captures alive, that they adopt the plan which is generally made use of (and I had imagined universally) by entomologists, viz. to carry with them on their excursions, a wide-mouthed bottle or two, containing camphor and blotting-paper, with a quill stuck through the cork and suspended by a string from the button-hole of the coat, to be ready for the reception of the beetles as they capture them. The camphor will in a short time stupify them and prevent them from struggling and injuring one another; and the blotting-paper absorbs the moisture. A strong kind of bottle is sold by Messrs. Christy, Stangate Glass-works, Lambeth, which is well adapted for this particular purpose, being less liable to fracture, than the common wide-mouthed bottles; it is known there by the nick-name of the *toad-bottle*. Tin-cases shaped like a bottle, with a tin-tube on the top or lid are also made use of for the purpose. On arriving at home with the captures, the bottles may be immersed in boiling water, which will speedily destroy what little vitality the camphor has left in the insects; or these latter may be themselves emptied into boiling water which causes instant death to them; the latter plan, however, is said to render them more liable to animalculæ.—*J. F. Dawson; Ventnor, Isle of Wight, October 1st, 1845.*

Carnivorous propensity of the Dragon-fly.—When seated in my garden during the last summer I was much amused by observing a large specimen of the common dragon-fly (*Libellula depressa*), soar past me with a large butterfly in its mouth. It alighted upon a tree to enjoy its feast. Having allowed it to remain in peace for some time, I at length dislodged him with a stone, when the butterfly fell to the ground. It had demolished the head and part of the body of a tolerably sized specimen of the Peacock butterfly (*Vanessa Io*). Although well-known that the Libellulidæ live upon small

insects I am not aware of any instance being recorded of their catching and devouring butterflies.—*C. R. Bree ; Stowmarket.*

Economy of Meloë.—At the meeting of the Linnean Society, on the 18th of November, the Lord Bishop of Norwich, president, in the chair, Mr. Newport read a paper ‘On the natural history, development, and anatomy of the Oil-beetle, Meloë, more especially of Meloë cicatricosus of Leach.’ This paper, which is intended by the author as the first part of a monograph on the genus Meloë, and relates almost entirely to the natural history of these insects, excited a good deal of attention. The author commenced by stating that although the Meloës are such very common insects in their perfect state, scarcely anything is known of their natural history or development, and that no one had been able to follow out their metamorphoses. The species on which he had made his observations are Meloë violaceus, *M. Proscarabæus*, and *M. cicatricosus*. These insects come forth at the end of March or beginning of April, the latter species nearly a fortnight later than the others. They feed on the butterwort and dandelion, and the female deposits her eggs in a little burrow which she excavates to the depth of about two inches in a dry soil at the roots of grass in situations exposed to the sun. The eggs are hatched in from three to five weeks according to the season, and the larva, which Mr. Newport has often seen come from the egg, is a little yellow hexapod, identical with that which is occasionally found on the bodies of the Apidæ and their dipterous parasites Volucella, Syrphus, &c. He found the parasitic habit of these larva by placing some Hymenoptera among the specimens which he had bred from the egg, when they immediately attached themselves to the bees, in the same way as he had found done by others he had captured. Thus far his observations agreed precisely with the observations and statements of Goedart Degeer, Reaumur, St. Fargeau, Brandt, and others, and he expressed his surprise that any entomologist of the present day should have denied their being the larva of Meloë, as had been done by Mr. Westwood, in face of the very direct statement of the observers mentioned. A number of observations were then stated to show some very marked effects which are produced on these larvæ by the presence of light, which Mr. Newport gave reasons for believing, founded on the recent discovery of Dr. Faraday, is the primary source of all vital and instinctive power. The number of eggs deposited by the Meloë is very great. He counted upwards of four thousand in one specimen, all ready to be deposited, and each Meloë deposits twice or thrice in each season. In the second and third layings there are not so many eggs as in the first. The larvæ when hatched, attracted by the light ascend the stems of flowers, and attach themselves to the trees, (when they alight to collect pollen) and are thus conveyed by them to their nests. The object of their attachment to the parent-bee is thus shown to be that of conveyance only, and not for the purpose of preying upon it parasitically. The young Meloë is supposed to feed in the bees’ nest on the food stored up for the young bees. The author has found the larva of *M. cicatricosus* in two different stages in the nest of *Anthophora retusa*, in both which it differs very greatly in form from the young larva. In the latter stage, where the larva is full grown, it is a thick heavy maggot not much unlike that of the bee itself, and it is then almost completely apodal. It changes to a nymph surrounded by the larva-skin, which is not thrown off, but merely detached from the body. The nymph resembles that of the Hymenoptera, and changes into a perfect insect within a very few days. This takes place in the autumn, and the insect then passes the winter in its cell in a state of hybernation, and only comes forth early next spring. The Bishop of Norwich in returning the thanks of the meeting to Mr. Newport, stated that

he had derived very great pleasure from the reading of his paper, which he thought extremely interesting and important, and he regretted that the law of the Society prevented the fellows from going into any discussion upon it. He should have liked to have made some remarks upon it himself for the purpose of obtaining the opinions of others upon the subject which he thought worthy of discussion, one of which he noticed especially as that which referred to the influence of light.—*Edward Newman.*

Battle between a Dragon-fly and a Wasp.—During a recent visit at Killarney in Ireland, while walking one morning in a neighbouring garden, my attention was suddenly attracted by a loud rustling noise,—a continued fluttering, as of something in severe pain,—which seemed to emanate from a bed at the distance of a few yards from the place where I stood. After listening for some time, I walked quietly up to the spot from whence it appeared to proceed, but could see nothing. At length, after much curiosity as to the cause of such an unusual sound, I observed beneath the edging of box with which the border was surrounded, a most extraordinary conflict going on between a dragon-fly and a wasp, in which the former was struggling for his life, while the latter held him firmly to the ground, endeavouring to mutilate him in every possible way. Wishing to see the whole process, I would not disengage the dragon-fly, but pushed them a little further from the edge, in order that they might have room to “fight it out,” and there stood in cold-blood to watch the issue. The wasp appeared in a most furious rage, ever and anon walking over the dragon-fly and using his jaws to considerable advantage. He attacked him in almost every part of the body in succession, but more particularly in the head and legs; first, biting actually off large portions of the latter, and then seizing on the former and fixing his jaws firmly in his eyes. In this manner he amused himself for upwards of twenty minutes; when, as though satiated with rage, he flew off and left his wretched foe writhing under the most agonizing torture, and apparently in a dying state. After waiting to see whether he would return, I picked up the dragon-fly (or at least *all that remained of him*); when to my astonishment, I found that the wasp had actually not only mutilated both his eyes, broken the membranes of his wings, and nearly wrenched off his head (which was turned with the mouth uppermost!)—but had positively eaten off all his legs, with the exception of a small part of one of the anterior femora, and left him a living trunk, truly ridiculous to behold, and perfectly unable to remove an inch from the fatal spot. Not knowing the state of the dragon-fly’s feelings, and thinking I might have possibly *over-rated* my friend’s misfortunes, I kept him to see if he would at all recover the calamity, but in the course of half-an-hour he expired in spite of all my exertions. His remains I have still in my possession. I have seen many battles between dragon-flies and other insects, but never one on so decided a scale as this.—*T. Vernon Wolaston; Jesus College, Cambridge, October 29th, 1845.*

Microscopical Society of London.

October 15th, 1845. —J. S. Bowerbank, F.R.S., &c. in the chair.

A paper by H. Deane, Esq., being a continuation of a former communication read at the last meeting of the Society ‘On Fossil Xanthidia found in Chalk’ was read. After a brief summary of the former paper, in which he stated that various species of the genus *Xanthidium* had been found by him in the Folkstone chalk, Mr. Deane went on to state, that this discovery by affording the means of isolating and mounting

these bodies in various ways for examination, suggested to him the possibility of ascertaining their true nature. Their minuteness, and other obvious circumstances prevented their chemical examination, and consequently they could only be operated upon mechanically. Their shape is that of a flattened sphere, the major part of them closely resembling some of the gemmules of sponges, most of them having a circular opening. The arms of all appear to be closed at the ends, and not tubular as has been supposed from the examination of some of the flint specimens under pressure in water between two pieces of glass. They were torn asunder in the same manner as a horny or cartilaginous substance would be, and the arms in contact with the glass were bent. Some, after maceration in water for several weeks became quite flaccid, thus entirely disproving their silicious nature. On the contrary there is every reason to suppose them to have been of a horny or cartilaginous nature. Some other bodies resembling the husks of peas were also observed, which appear to be identical with the *pixidiculæ* in flints, but these although agreeing in colour, he does not consider to have any relation to the *Xanthidia*, but from their close resemblance to sponge-gemmules, to be some animal or animals in a progressive state of development.

Another paper by the same gentleman 'On a mode of isolating the silicious shells of Infusorial Animals found in the Ichaboe guano,' was also read. After premising that the guano from Ichaboe was soon found to contain silicious shells of microscopic animals allied to those brought from Richmond in Virginia and from Bermuda, he stated that the extreme difficulty of finding them in the ordinary mode, induced him to try whether by decomposing the guano by means of nitric acid, more satisfactory results might not be obtained. The experiment was successful, and the following is the method he employed. Take any quantity of pure Ichaboe guano and wash it by repeated ablutions of distilled water until the water is no longer coloured, observing after each addition of water that it must be well stirred two or three times and allowed to settle for some hours. When sufficiently washed, a small quantity of Hydrochloric acid is to be added to the water last used; this dissolves some portion of the guano with effervescence, and causes a more perfect subsidence of that portion which it does not act upon. After this, allow sufficient time for the deposit to become well settled down then the clear liquor being poured off as closely as possible without loss of the sediment a quantity of nitric acid, in the proportion of two fluid ounces to every ounce by weight of the guano employed is to be added; a strong effervescence takes place, which is to be assisted by its being placed in a warm place, at a temperature of about 200 for six hours, during which time the greater portion of the guano will be dissolved. After allowing it to stand in a cool place for twenty-four hours, pour off the acid liquor and wash the sediment with plenty of distilled-water. The fine portion of this sediment will contain all the silicious shells of the guano perfectly free from extraneous matter.—*I. W.*

New work on the British Desmidiæ.—Our readers will be pleased to learn that Mr. Ralfs of Penzance, is about to publish a monograph of this interesting tribe of microscopic beings. The author proposes to describe all the British *Desmidiæ*, and as correct figures will be absolutely essential to make the descriptions of such minute objects intelligible, he will spare neither care nor expense in rendering the plates, which will be executed under his own eye, as accurate as possible. The engravings will be on copper, since experience has proved, that the delicate markings of the *Des-*

midieæ cannot be sufficiently displayed by lithography. Upwards of one hundred species will be introduced, many of them either altogether new, or now first noticed as British. The conjugated state of the Desmidiæ is interesting sometimes, from its resemblance to the same state in the Conjugatæ, sometimes from the similarity of the spores to fossil bodies found in flint, and considered by Ehrenberg and other naturalists as species of *Xanthidium*. On these accounts, and also because few instances have been hitherto recorded, it is intended to give, not only full details of the process, but as far as practicable, to show the different stages by figures. Examples will be taken from one or more species in each of the following genera: *Glæoprium*, *Didymoprium*, *Micrasterias*, *Euastrum*, *Cosmarium*, *Xanthidium*, *Staurastrum*, *Tetmemorus*, and *Closterium*. As their animal nature has been maintained by many able writers, this question will be examined, and sufficient reasons produced for considering the Desmidiæ to belong to the Vegetable Kingdom. Their modes of growth and other facts which may illustrate their economy will receive particular attention. That nothing may be wanting to the utility of this Monograph, the introduction will contain ample directions for finding and gathering these minute plants and the different methods of mounting them for the microscope. As the work cannot be produced without a considerable outlay, the author is desirous of receiving the names of subscribers. The price is to be 21s.—*Edward Newman*.

Remarks on the piscatory habits of the Polecat.—As the 37th No. of 'The Zoologist' only reached me late on Saturday the 17th of January, I fear it will be impossible for my few remarks on the piscatory habits of the polecat to reach you in time, for insertion in your February number. If, however, these can be admitted without any injustice to your other more valued correspondents I shall be greatly obliged, as I flatter myself they are calculated to solve some of Mr. Frere's doubts respecting certain habits of the polecat and eel. I confess that I am much gratified that your observing correspondent Mr. Frere has forwarded to you such interesting remarks in the same number of 'The Zoologist' on certain habits of the polecat (Zool. 1204), and also on the eel (Zool. 1216), and more especially as these facts, taken conjointly, conspire to prove what otherwise, to some persons might appear a contradiction. I beg therefore to make a few hasty observations on the habits of the polecat which I have noticed in my own neighbourhood, and more especially in reference to its predilection for eels, and trust they may serve in some degree to corroborate and illustrate the statements of Mr. Frere. We have polecats abundant in Pilling during the whole year, and in the winter season, when the water in the ditches and main-drains, is chiefly congealed, and more especially when the ice is slightly covered with snow, the foot-prints of the polecat may be traced on the ice, and the most indubitable evidence is then afforded of its predilection for fish. Under such circumstances as I have just now mentioned, I have repeatedly ascertained that this animal is a most expert fisherman. For in severe and long-continued frosts many eels ascend our open drains, and as these water-courses are most slightly frozen over nearest to these springs, the polecats, either by instinct or experience, discover the retreat of the eels. In tracing the foot-prints of the polecat, it will soon be ascertained, that he halts at every hole or opening he meets with in the ice, and at once commences fishing by introducing a fore-foot into the water, and no doubt groping all around under the ice as far as he can reach in search of such eels as

may have come to the aperture for air. This is at once distinctly proved by his dirty foot-prints afterwards in the snow. It is also an admitted fact in the natural history of the eel that it cannot exist without air. If, therefore, the water of any pond be congealed for any length of time, and a small aperture be made in the ice, the greatest portion of the eels in that pond will, in a short time, assemble around that opening for the benefit of the admitted air. This interesting fact, I am informed may easily be confirmed by introducing a small bundle of straw into the water through the aperture, as I am assured that many eels will soon imbed themselves in the straw, and if the hole be kept open for a few days, a nice dish of this delicious fish may be generally drawn out with the straw. This, I am told is no very unusual plan in taking eels from ponds in this part of the country. The polecats, then, aware, either from instinct or habit, of this propensity of the eels to assemble round any aperture in the ice for the benefit of the admitted air, invariably search for them at every opening they meet with, and in tracing their foot-prints in the snow as above described, it will frequently be discovered that eels have been dragged from under the ice by these wily fishermen, and either devoured on the surface or carried to their dens to satisfy their hunger at some future opportunity. Bewick, to whom Mr. Frere alludes, states, if I recollect rightly, that about a dozen eels were on one occasion taken from the den of a polecat; a strong evidence of this animal's sagacity to provide against a famine. I may here also add that I have known a polecat killed by a fisherman's dog on our extensive sands nearly two miles below high-water-mark, and as herrings were taken at that very time in great numbers in nets suspended on stakes, it is very probable that this polecat had been attracted to near low-water-mark by the strong smell of captured herrings. Whilst on the history of the polecat, I may perhaps be permitted to remark that this animal still abounds in many districts of the North of England, though the gamekeepers use their utmost endeavours to annihilate the breed. I do not however consider the polecat so deadly an enemy to grouse, pheasants, partridges, hares, and rabbits, as either the stoat or the common weasel, and am disposed to think that when it does feel inclined to indulge in delicacies, it prefers rabbits, and most probably because it can enter their burrows and secure this prey most easily. Neither is the polecat so delicate an animal in its taste as the stoat. The latter seldom feeds on dead animals, and the blood of its victim is evidently its most delicious repast; whilst the polecat will be found frequently to act the part of a scavenger, and he contents to feed on the carcase which has been left by the stoat. The polecat will eat frogs, and even the carcasses of sheep and other cattle, and as it is very inferior in activity to the stoat, and therefore less fitted to secure delicious food, nature seems to have given it a less refined appetite.—*J. D. Banister ; Pilling, Garstang, Lancashire, January 21st, 1846.*

Carnivorous propensity of the Hedgehog.—With reference to the interesting anecdote of the hedgehog (Zool. 1204), I think there can be little doubt of its carnivorous habits. I never, indeed, saw it attack a bird, but the address and sanguinary courage it shows in making war upon serpents, proclaim it at once a beast of prey. Neither can this be an unnatural inclination brought on by confinement, as I have more than once observed the viper to become scarce, or disappear entirely from the border of a wood, after a hedgehog had taken up his quarters amongst them. But granted that the animal is carnivorous, we have no need to think the worse of it on that account; the services it renders to man by destroying venomous reptiles, amply counterbalance any petty depredations it may commit. Indeed its remarkable exemption from the effects of so many poisons seems to me an express provision of Providence to enable it

to attack the viper with impunity.—*I. W. Slater ; Fairfield, January 10th, 1846.*

[I have long been convinced that the hedgehog is essentially a snake-destroying animal. Some observations lately under my eye, whilst superintending the reprint of the 'Letters of Rusticus,' go far to prove that snakes and adders are the natural and usual food of the hedgehog. I may also state that the writer to whom I have alluded has a passage conveying a somewhat similar opinion to that expressed by Mr. Slater, namely, that the spines of the hedgehog are provided as an especial protection against the fangs of the adder; and further that the roots of plantain spoken of by Gilbert White, as having been eaten by the hedgehog, must have been devoured by the larva of a moth, perhaps a species of *Hepialus*. In all these remarks I fully concur.—*Edward Newman.*]

Cattle mouting bones.—I wish to call your attention to Pontoppidan's account of cattle mouting bones. In the second part of his 'Natural History of Norway,' he says, "it is not only fish-bones the cows here eat, but likewise the bones of their own species, which they swallow greedily, and gnaw them with their teeth as dogs would. Nay, the eating of bones is a cure for the cows of this country when they have broke their legs.—*H. Stanley ; Alderley Park, January 22nd, 1846.*

The Spotted or Silver Eagle.—Your grand new eagle is the Silver Eagle of this country, a very common bird. We have two kinds of eagles, the golden and the silver. Your figure is a good deal like the bird it is meant for, but the spots are not clear enough, nor are they the right shape, they are oblong and of a clear, silvery white. In Cahirciveen you may see both kinds of eagle in captivity, if you or any of your friends should be there, enquire at the hotel. What we call the golden eagle has a white tail when old.—*No name or address, arrived January 10th, 1846.*

The Spotted or Silver Eagle.—Neither your figure (*Zool.* 1208) nor Mr. Yarrell's of the *Aquila Nævia* is good: both figures represent the scapulars and wing coverts as merely tipped with white; the fact is the spots are most beautifully defined and regularly elliptical.—*Robert Ball ; Granby Row, Dublin, January 3rd, 1846.*

The Spotted or Silver Eagle.—When in the neighbourhood of Killarney in May, 1840, I was told of an eagle quite new to me, and being determined to obtain one dead or alive, I posted off to Valentia Island on the west coast. I soon found that the eagle I was in quest of was perfectly well-known, that it was called the silver eagle, and that a pair bred regularly on the rocks in Valentia Island. Having obtained a boat, I landed on the Island and almost immediately on landing I saw a tame eagle of this very species; he immediately threw himself into an attitude of resistance, and seemed inclined to dispute the passage. I found that this beautiful bird was not to be purchased for money: the gentleman to whom it belonged had had two taken from the nest; but a few days before I was there one of them had swallowed the bait and hooks left by some fishermen on the beach while they were gone to get some refreshment, and this killed him; unfortunately no attempt was made to preserve this specimen.—*Richard Weaver ; 9, Vine Street, Birmingham, January 3rd, 1846.*

[The insertion of the first of these notes of the Silver Eagle without name or address is at variance with my established custom, but the writer is perhaps unacquainted with this, will he give his real name and address, as I am particularly desirous of

obtaining a correspondent in the south-west of Ireland? I may perhaps be excused for remarking that the white-tailed or Sea Eagle is a perfectly distinct bird: it becomes an interesting enquiry whether the Golden Eagle does inhabit the south of Ireland.—*Edward Newman.*]

Occurrence of the Rough-legged Buzzard in Nottinghamshire and Derbyshire.—Six or seven years ago, there was a great immigration of the rough-legged buzzard, *Buteo Lagopus*, to the midland-counties, which I have not seen recorded. Many specimens were killed at intervals in Nottinghamshire and Derbyshire, and happened to come under my notice. I think I could not have seen less than a dozen, only two of which came into my possession. Most of these were caught in traps, and some I saw before they received the *coup de grâce*, the projecting eye-brow and piercing eye gave them a very fierce and noble expression.—*J. Wolley; Trinity College, Cambridge, November 21st, 1845.*

Swallows at the Carron Iron-works in winter.—The present Lord-president of the Court of Session in Scotland, remembers about forty years ago, of visiting the Carron Iron-works in the depth of a severe winter. There was a pond in the immediate neighbourhood of the immense furnace of the establishment, and the temperature was mild, and even warm, over and around it. In consequence of this, it swarmed with insects even at that season, and a number of swallows were busily flying over and around the pond seizing their prey. When his lordship remarked this circumstance to the men, they said, “we never want swallows here.”—*Sydney Smith; Principles of Phrenology.*

Late stay of the Swallow at Penzance.—I observed as late as the 30th of November of this year a chimney-swallow at St. Mary's Church-yard in this town, and it is very possible that a later date can be recorded of the appearance of this bird in our neighbourhood. Several house-martins have from time to time been observed in December in and about the town. I obtained from the Island of Scilly last week two specimens of the greenshank sandpiper (*T. Glottis*).—*Edward Hearle Rodd; Penzance, December 26th, 1845.*

Late stay of the House-martin at Alton.—On the 25th of November I observed a house-martin flying along the street under the eaves, at eight o'clock, a.m. It flew languidly and appeared a young bird, but as it fluttered much and was soon out of sight, I cannot speak decidedly as to this. White, (whose beautiful and interesting Selborne is within an hour's walk across the fields from here) I find never saw any species of swallow after the first week [in November, except a few sand-martins, turned out of a bank, at the end of this month. I have only resided in this neighbourhood for a twelvemonth, and have not met with any ornithologists, although there appears abundant scope for observation in this deeply interesting branch of Natural History, as this locality abounds with birds, mostly the smaller species; other branches claim all the little attention my limited leisure allows.—*Henry Ecroyd Smith; Alton, Hants, December 28th, 1845.*

Occurrence of the Grosbeak at Stowmarket.—On the 6th of November last year I saw a pair of male grosbeaks (*Loxia Coccothraustes*) feeding under a rose-bush in my garden. I succeeded in capturing one of them, and another was shot during the same month at Farnborough Park about two miles hence, which is now in my possession.—*C. R. Bree; Stowmarket.*

Occurrence of the White-winged Crossbill at Derby, November 21st, 1845.—Was shot in my garden at Mickleover, a female of the white-winged crossbill (*Loxia Leu-*

coptera) it is now in my collection. This bird came along with a flock of fieldfares, and suddenly alighted from them upon a fir-tree, where uttering a peculiar note, caused it to be shot without at all being aware of what it was. The siskin has been tolerably numerous this season.—Robert J. Bell; Mickleover House.

Domestication of Wood-pigeon.—The common wood-pigeon, or Cushat doo, (*Columba palumbus*) is, I believe, almost universally considered incapable of domestication (Zool. 660 and 1025); at least hitherto so far as I am aware all *reported* attempts to domesticate it, have entirely failed; thus giving ground for drawing such a conclusion. I am glad, however, to be able to make known through the medium of your highly interesting journal, that the domestication of this bird is not to be ranked amongst impossibilities. About eight or nine years ago while spending the summer vacation (I was then a school-boy) with some friends in a retired corner in Fifeshire, I procured a very young bird of the cushat doo. Being enamoured with the lovely creature, and having then little else particularly demanding attention, I devoted the greater part of my time, from a very early hour each morning till the evening in nursing my favourite, and then I truly felt "*Labor ipse voluptas*." The pigeon was kept in an outhouse, the door of which remained open during the whole day; and it was thus allowed full liberty, which it often availed itself of; but always returned safely to its abode, from which by itself it never at any time wandered far. When I walked forth into the woods and fields, it was my sole companion, and it would sit with great composure on my shoulder or arm as I moved along; and when offered food, it ate greedily from the hand. An end was however soon put to the career of this, to me, highly interesting bird; for entering a house where cows were kept, about six weeks or two months after I had been put in possession of it, it received a kick from one of these animals which sent it reeling with a broken leg, and to conclude the tragic scene, the cow seized it with her teeth and chewed it, till almost every bone in the poor animal's body was broken. So ended the days of my poor pigeon; but it lived long enough to show that it was really *domesticated*. All the circumstances are as fresh in my memory, as if they had occurred but yesterday.—George Lawson; Hawkhill, Dundee, December, 1845.

Occurrence of the American Bittern near Fleetwood.—A beautiful specimen of the American Bittern (*Botaurus lentiginosus*, Gould) was killed about the 8th instant in the vicinity of Fleetwood, and has since been presented to the Literary and Philosophical Society of this borough; the bird upon dissection proved to be a male. The following particulars may be interesting to some of your readers, as differing a little or being altogether left out in the description of the bird by Mr. Yarrell. Extent of the expanded wings $42\frac{1}{4}$ inches, from the carpal joint to the end of the longest quill $11\frac{3}{4}$ inches, total length $27\frac{1}{4}$ inches; length of tarsi $3\frac{1}{2}$ inches; of middle toe and claw 4 inches; from the point of the bill to the frontal feathers 3 inches; to the angle of the mouth 4 inches. Front of the head very dark, the centre of each feather blackish-brown, margined with reddish-brown. The black space on each side of the neck below the ear 3 inches long by 1 broad; primaries and secondaries of the wing slate-black, the first four feathers slightly tipped with brown, all of equal length and the longest in the wing; legs yellowish green; front of the shank and upper surface of the toes olivaceous brown; sole of the foot and under-surface of the toes yellow.—James Cooper; 132, Victoria Street, Preston, December 20th, 1845.

NATURALISTS' CALENDAR FOR MARCH.

BIRDS.—At this period of the year there is a general movement of birds towards the poles. Most of the ducks take their departure from our shores during this month, and pass the breeding season in high northern latitudes. The scaup duck (*Fuligula Marila*), and the tufted duck (*Fuligula cristata*) mostly leave at the early part of the month, as does the golden eye (*Clangula Glaucion*), the wigeon (*Mareca Penelope*), gadwall (*Chauliastur Streperus*), and the garganey (*Cyanopterus Circia*) which breed in more temperate climates than the former species, remain longer with us, and seldom quit our shores till the end of the month, or the beginning of April. The waders begin to assume the breeding plumage. The sanderling (*Calidris arenaria*) is exchanging its delicate light-grey winter livery for the more variegated dress which it wears during the breeding season. The same may be said of the godwits (*Limosa rufa* and *melanura*); by the end of the month many of the males have acquired the full summer plumage; the females of all the waders retain the winter plumage longer than the males, and many may be met with throughout the month of May which have only partially assumed the nuptial dress. The warblers begin to arrive, and the lesser pettychaps (*Phyllopneuste rufa*) is always heard in the course of the month; the 24th may be considered about the average time of its arrival, but it occasionally visits us several days earlier. The wheatear (*Vitiiflora Œnanthe*) arrives about the same time, and the black-cap (*Curruca atricapilla*) and the redstart (*Ruticilla Phœnicura*) sometimes appear at the latter end of the month.

INSECTS.—Many species of Lepidoptera may now be met with. The first warm, sunny days the beautiful orange underwing moths (*Brepha Notha* and *B. Parthenias*) are to be seen in woods flying in the day time, and occasionally alighting on wet spots in the open parts. *Ceropacha flavicornis* also flies by day, but is frequently to be found at rest upon the trunks of birch-trees. The brimstone butterfly (*Gonepteryx Rhamni*), the peacock, elm, and common tortoiseshell butterflies (*Vanessa Io*, *Polychloros* and *Urtica*) which have passed the winter in a torpid state, are aroused by the first warm days, and a few specimens of the small white butterfly (*Pontia Rapæ*) emerge from the chrysalis.—*Henry Doubleday, in Naturalist's Almanack for 1845.*

Occurrence of Steller's Western Duck at Filby in Yorkshire.—August 15th, 1845, was shot at Filby, Yorkshire, by Mr. G. Curzon of Weston Lodge, Derbyshire, a male, assuming its winter plumage, of Steller's Western Duck (*Fuligula dispar*). This bird has been submitted to the inspection of Mr. Yarrell; it is now in Mr. Curzon's collection.—*Robert J. Bell; Mickleover House, near Derby.*

Remarks on the Tracheæ of Wild Geese.—Although Mr. Yarrell in his 'History of British Birds' has described the tracheæ of the different species of ducks, I believe there is no account of those of our four grey geese, and as the distinctions between them derived from plumage and other external marks are very slight, perhaps such of your correspondents as may happen to possess the tracheas of the *Anseres segetum*, *ferus*, and *albifrons*, will be good enough to make known the difference between them. In the mean time, as I have lately prepared a specimen of the *Anser Phœnicopus*, per-

haps it will contribute to the better understanding of the distinction between the species if I describe it. About an inch and a half from the beak the trachea is abruptly contracted or pinched in, from its formerly cylindrical form. This contraction extends for about half an inch, whence it resumes its former shape till within four inches (or thereabouts according to the state of extension of the trachea) of the bronchial tubes, where it is more gradually enlarged and flattened, for about an inch and a half, whence it regains its cylindrical form, and maintains it to the parting off of the bronchial tubes.—*H. T. Frere; Aylsham, January 29th, 1846.*

Norfolk Swan-fattening.—I may add, though it is not strictly ornithological, one or two points to Mr. Yarrell's account of Norfolk swan-fattening. The proprietor sends to be fatted either two lean swans on condition of receiving one fat one, or a swan and a guinea. After most of the swans have been sent for, till perhaps there are not above half-a-dozen left, these are killed, as so small a number will not feed sufficiently, they will only fat in flocks. If you get one at Norwich the expense is this,—Lean swan, one guinea; fattening the swan, one guinea; dressing the swan, one guinea; cook's customary fee, one guinea;—so that it costs four guineas, and when done is nearly as good as a goose: *experto crede.*—*H. T. Frere; Aylsham, January 29th, 1846.*

The Oil-Gland.—

“Nec aliud quicquam—quæritur,
Quàm corrigatur error ut mortalium,
Acuatque sese diligens industria.”

“Will any naturalist declare that he has actually seen a bird procure liquor, or oil, or whatever else you choose to call it, from the gland with its bill, and then apply that liquor or oil to the plumage?” Thus writes one who has written but too little, our own Waterton. I will declare that I have seen a bird so act. I have a tame magpie; on the evening of the 16th ult. I was writing under a powerful gas-light and the bird was on my left wrist; it presently began to preen its feathers, and ever and anon it applied its bill to the oil-gland, and I most distinctly saw a matter, a liquid, shining on its back, wings, and breast, in little palettes, looking as if one had taken a feather and placed a small quantity of oil over the various parts of its plumage. Again, quoting from “Nature's true son, the friend of man and truth,” who asks “How is the head and part of the neck to be supplied with oil?” I answer thus,—after having applied its bill to the nipple many times and deposited the oil on the surface of its plumage, (for it merely ran its bill on the outside), it again pressed the gland, and immediately began to scratch the point of its bill with its left claw, and without placing that foot down, directly scratched its head all over the left side. Again pressing the gland, it did precisely the same to the right side. I do not declare that by the action of scratching it transferred the liquor from the bill to the claw and thence to the head, because I cannot prove it, the action being so quick: let it speak for itself. I as firmly believe it did so, as that it was there and then present before me. Many are the times that I have seen it do this; and more are the times that I have seen the liquid on its feathers immediately after it had pressed the gland; I too have seen the liquid, but not often, on the sides of its bill. If any doubt this let them come here, and each day they may see what I have stated. After having compressed the gland and carried its bill

down its back, it would throw back its head after the manner of a water-fowl whilst washing, and as a bird does when it wishes to cleanse its eyes, and so transfer the matter from the feathers of the body to those of the neck out of the range of the bill. "Providence never does anything by halves," seeing that that part of the plumage which is out of the range of the bill is kept clean, and in order, by the aid of the claws, and the act of rubbing the one part against the other.

I have often thought of writing what I had seen, but having Mr. Waterton's (no mean authority) flat denial as to the lubrication of the plumage, I hesitated; till at last having had so many fair and open evidences thereof, I could not refrain. I have a jackdaw, but it does not make such frequent use of the gland as does the magpie.—*Henry Daniell; Lambert House, Bath, January 17th, 1846.*

Notes on the Birds of Belgium. By JULIAN DEBY.

(Continued from page 1189 and concluded.)

DIVISION VI. concluded.

Group *d.* Water-birds which are regular migrants in spring and autumn when on their way to and from their breeding stations. A very numerous group, which I divide into (a), maritime or littoral, (b), inland, and (c), both maritime and inland passengers.

a. Water-birds, which in migrating north and south follow the sea-coast, and are only accidentally met with inland.

Dotterel, *Charadrius Morinellus*. This bird is not a summer resident in Belgium, and is only seen during the two first months of autumn. It cannot be considered a common bird, although it is annually seen in the localities it frequents along our sandy shore. I have never noticed this bird on its return in spring, which inclines me to believe that it must follow some other migratory route at this season to that it pursues in autumn.

Kentish Plover, *Charadrius Cantianus*. This bird is common in spring and autumn, and has sometimes been known to nestle on the sand-hills.

Grey Plover, *Squatarola cinerea*. Common.

Turnstone, *Streptilas Interpres*. Regular visitant in spring and autumn; I do not believe that any remain stationary with us during winter, as they are said to do on the English coast.

Sanderling, *Calidris arenaria*. Gregarious and not uncommon

on the sandy beach in spring, and in August and September. Never or scarcely ever nestles with us.

White Spoonbill, *Platalea leucorodia*. Seen on its double passage. Very accidentally met with inland. I know nothing of its habits.

Whimbrel, *Numenius Phaeopus*. Not quite so common as the curlew (*N. arquata*), but a very regular visitant to our shores singly, in couples, or in small parties.

Greenshank, *Totanus Glottis*. Stragglers are seen in autumn and sometimes in spring. It has been shot far inland on the banks of rivers, but is very seldom met with in such situations.

Bar-tailed Godwit, *Limosa rufa*. Rather uncommon, but seen every year on the sea-shore; accidentally on the upper Meuse as high as Dinant, and according to Mr. De Selys in the marshes of the interior.

Curlew Sandpiper, *Tringa subarquata*. Not uncommon on the coast of Flanders when on its passage. Never nestles here.

Knot, *Tringa Canutus*. Common. Gregarious in spring and autumn. Some few appear to pass the winter with us when the cold is not very intense. Never nestles, and never seen far inland.

Little Stint, *Tringa minuta*. Not common. Regular double visitant. Seen singly or in couples.

Temminck's Stint, *Tringa Temminckii*. Not rarer than the little stint on our coast. I have never seen it in the interior.

Schinz's Sandpiper, *Tringa Schinzi*. Not uncommon. Several continental authors consider this bird as a local variety of the dunlin, and Temminck says (but I believe erroneously) that it is specifically distinct from the North American bird bearing the same name.

Dunlin, *Tringa variabilis*. Common. Gregarious. They may often be seen feeding with the gulls and terns at the edge of the receding tide and in the sheets and pools of salt water left on the sands. Sometimes nestles among the coarse vegetation on the sand-hills. Appears on our shores in March, April, August, and September.

Purple Sandpiper, *Tringa maritima*. This, as well as all the other species of *Tringa* found in Belgium, is a vernal and autumnal passenger. It runs very fast on the sand, and is then difficult to discern, from being of nearly the same colour as the surrounding objects. It is generally seen in small flocks, and scarcely ever found in the marshes or on the rivers of the interior.

Arctic Tern, *Sterna arctica*. In spring and autumn. Seen sometimes several miles inland after severe storms. This bird is not

common with us, and might be placed amongst the accidental stragglers.

Lesser Black-backed Gull, *Larus fuscus*. Not uncommon. Periodically on our shores; not yet noticed inland. I believe the metropolis of this species to be Southern Europe, though some birds seem to breed as far north as Norway.

b. Water-birds, which on their passage frequent heaths, marshes, rivers, lakes, or woods, and are only accidentally found on the sea-shore.

Great Plover, *Ædicnemus crepitans*. Not uncommon. I believe a few nestle on our heaths.

Golden Plover, *Charadrius pluvialis*. Very common in some parts of the country in spring and autumn. Immense numbers are killed to supply the town markets. Gregarious on heaths and sandy plains.

Common Crane, *Grus cinerea*. Rather scarce. Vast flocks are seen every year flying across the country. This bird is exceedingly shy, and when settled on the ground very difficult of approach.

Little Bittern, *Botaurus minutus*. Amongst reeds near streams and rivers, also in extensive marshes. It is not common, and appears in August, September, and spring.

White Stork, *Ciconia alba*. Seen in April and in August on its way to and from its breeding station, (Holland and Northern Germany.) This bird migrates by day and rests by night.

Green Sandpiper, *Totanus ochropus*. (See 'The Zoologist,' Div. vi. Group c).

Black-tailed Godwit, *Limosa melanura*. Not uncommon. Seen in spring and autumn in the Brussels market, but not as an article of food.

Great Snipe, *Scolopax major*. In marshes and on river-banks. Not common in Belgium. Found in greater numbers in some parts of France. This bird runs some time before rising, when hunted by dogs, and is often very difficult to find. It never nestles here.

Common Snipe, *Scolopax Gallinago*. Very common during the first and latter parts of the shooting season. Seen singly, in couples, or in small parties in damp pastures, low woods and marshes. I believe it never nestles with us. This bird may often be heard on a clear night, uttering whilst in flight its two or three peculiar, and to

the sportsman and ornithologist, well known piping and tremulous notes. Great numbers come to market with other game.

Jack Snipe, *Scolopax Gallinula*. Very common. Found in marshy places where the vegetation is very thick. It is very difficult to be made to rise, and will allow itself to be nearly trodden on before taking wing. Does not nidificate with us.

Shoveler, *Anas clypeata*. Regular visitant to our marshes. Sometimes, though rarely, seen in Brabant. Not common. This duck is exceedingly shy and difficult to shoot. It is accidentally found on the sea-shore, as are all the *Anatidæ* in general. As food, the shoveler is excellent, its flesh being tender and succulent.

Pin-tail Duck, *Anas acuta*. Comes before the first cold weather, and repasses in spring in flocks. It is by no means uncommon in our markets.

Wild Duck, *Anas Boschas*. Our commonest wild-duck in spring and autumn, when it is found on all lakes, marshes, rivers, and streams. Vast numbers are annually destroyed to supply the poulterers, by many different ways too long to be here enumerated. Some few are said to remain and nestle in our marshes. Very seldom found on the coast.

Several hybrids between this species and the Muscovy duck (*Anas moschata*) have been shot in a wild state in different parts of Belgium and the North of France: they are the *Anas purpureoviridis* of Schinz, &c.

Garganey Duck, *Anas Querquedula*. This pretty species is not uncommon, though rather local, being only found in some of our marshes and on rivers. It is seldom seen in the Brussels, but is very common in the Antwerp market. It is gregarious, and less shy than our other wild-ducks.

Teal, *Anas Crecca*. Very common in spring and autumn. I do not believe it nestles with us, though it is known to do so in still more southern latitudes in France, &c.

Wigeon, *Anas Penelope*. Common on its double passage. None nestle or hibernate with us. In some parts of France it is said to do both. Very seldom found on the sea-shore.

Smew. (See Zool. group c).

Red-breasted Merganser. (See Zool. group d. c).

The Eared Grebe, *Podiceps auritus*. Rather uncommon, and only seen on its passage. Sometimes on the sea-shore. This bird has been found in different parts of France, Germany, and Switzer-

land; it is said to be common and resident on some of the lakes of the latter.

Little Grebe or Dabchick, *Podiceps minor*. This species might have been placed in my group *a*, as a certain number nestle with us, but the majority being migratory, I have preferred mentioning it here. The history of this species is better known than that of any other grebe, and most interesting accounts of its habits have appeared in 'The Zoologist' from the pens of Messrs. Atkinson and Parsons.

I do not believe that this bird has the power of stationary submersion, its flat and subcoriaceous feet being very ill-formed for taking hold of plants or other substances, which I consider the means employed by the moorhen (*Gallinula chloropus*). I do not think (and Mr. Atkinson seems to be of the same opinion) that birds possess the voluntary power of suddenly expelling air from their air-cells, or of preventing it from introducing itself into them; this, however, even if it took place, would not much diminish the bird's bulk, as the cells have, I believe, no movements of contraction of their own, and the lungs could certainly not be deprived of air without causing almost instantaneous death by suffocation.

Although I do not like being at variance with any intelligent naturalist, I am sorry not to be able to side with Mr. Slaney's statements (Zool. 667); and as the great aim of the studies of naturalists is the attainment of true principles and undeniable facts, I hope he will excuse the following lines, and that they will induce him to change his, perhaps, too hastily formed opinions respecting the submersion of water-birds.

It is well known to all who have opened a book on physics, that any substance floating on a liquid loses a quantity of its weight equal to the weight of the volume of liquid displaced. Now, a moorhen, or any other bird while swimming, displaces a volume of water which is equal, or more than equal, in weight to the weight of its body; that is to say, in other words, that its specific gravity is less than that of water.

If, then, muscular contraction took place, sufficient to make the difference in bulk (which causes the displacement of the volume of water) equal to a sum which would be less than the weight of the bird, it would sink of itself; but if no such contraction took place, the simple exclusion of air from the cells would not be sufficient in itself to occasion submersion. For instance, let us suppose a moorhen weighs 2 pounds, to remain above water it must displace a volume of water weighing as much or more than 2 pounds, let us say $2\frac{1}{4}$; for

the bird to sink or submerge itself, it ought to have in its power to contract itself to such a degree that it would only displace a volume of water less than its own weight, let us say $1\frac{3}{4}$ pound; but I am persuaded that this is not possible, as the contraction which would expel a cubic inch of air from its body* would not of itself be sufficient to cause such an effect.

Mr. Slaney speaks also of the use air-cells may be of, to birds of prey; I am fully persuaded that they are greatly conducive to their buoyancy, but I do not believe that they have anything to do (in the manner that gentleman intimates) with the sudden swoops these birds make, which are I think produced by a sudden and powerful movement, giving the impulse (obliquely downwards) and followed by a momentary semi-expanded state of the wings (serving as a parachute to prevent their too rapid fall); to this must be added the motions of the legs balancing the centre of gravity, and the expanding, closing, and turning of the sail in various degrees, regulating and directing the flight.

The air-cells of birds of prey are a beautiful provision of nature, as in augmenting their buoyancy, it impedes greatly the extraordinary velocity with which solid bodies are known to fall through the atmosphere (by the laws of gravitation), and which would cause an eagle pouncing suddenly on its prey from a height of from between 2000 and 3000 feet to be dashed to pieces, without its having power to save itself, if it were deprived of these cells.

I finish here this dissertation, which I fear has been too long, and return to my birds, concluding the migratory ones of the present group by

c. Water-birds, which at the time of their migration through Belgium are to be found indiscriminately along our coast, and in the interior, on rivers, lakes, ponds, marshes, &c.

Ringed Plover, *Charadrius Hiaticula*. Not uncommon. It runs very fast on the sands of the sea-shore; taking but short flights when driven up. Its note is a shrill whistle. Seen in small flocks or in couples, and never nestles here, though it does so commonly on the banks of the Moselle.

* I do not suppose a moorhen can expel more than that quantity of air at each expiration, as man when breathing only throws out about twenty times that sum.

Common Curlew, *Numenius arquata*. Common. This bird has been shot in all parts of the country, from the wild and rocky Ardennes and valleys of the Meuse and Lesse to the low plains of Flanders and Brabant, and from the wooded marshes of Limbourg to the vast, sandy heaths of the Antwerp Campine.

Spotted Redshank, *Totanus fuscus*. This species and the next are not uncommon in spring and autumn.

Common Redshank, *Totanus calidris*. Not commoner than the last.

Avocet, *Recurvirostra Avocetta*. Scarce on the sea-shore and in rivers. I have never seen living specimens of this bird.

Bean Goose, *Anser segetum*. "Regular passenger towards the end of winter. They rest at night in newly-sown fields, and are very shy. There are also a few flocks of vagabond bean-geese which appear with heavy snow, and which sojourn in our plains until the thaws begin. Common in winter at the mouth of the Scheld and on our shores." (De Selys). Very seldom, however, seen in the neighbourhood of Brussels.

Pochard, *Fuligula ferina*. Common on extensive marshes and lakes and at sea. Rather scarce for inland. Some are brought to our markets. Come in large flocks, which fly without forming the V-shaped figure of many wild water-birds.

Ferruginous Duck, *Fuligula Nyroca*. Uncommon.

Golden Eye, *Fuligula Clangula*. Common. Some birds pass the winter with us, but the majority are migratory.

Red-breasted Merganser, *Mergus serrator*, and Goosander, *Mergus merganser*. Both occasionally met with in spring and autumn.

Red-necked Grebe, *Podiceps rubicollis*. Not uncommon on rivers and marshes in different parts of Belgium; sometimes also on the sea-shore. Never remains with us in summer.

Group e.

I have created this group distinct from the one containing the birds of accidental occurrence, because the present ones are seen regularly every year, though at irregular periods during the winter months.

Bernacle Goose, *Anser leucopsis*. On the sea-shore, and more seldom on the Scheldt and in the interior. I have in my collection a specimen killed near Brussels.

Grey-legged Goose, *Anser Ferus*. Very uncommon in some parts

of Belgium, less so in others. I know nothing of its habits in a wild state.

Hooper, *Cygnus ferus*. Not uncommon on the sea-shore. Sometimes seen far inland. This fine bird is always seen in flocks.

Great Northern Diver, *Colymbus glacialis*. Scarce in winter.

Red-throated Diver, *Colymbus septentrionalis*. Our commonest species of diver on the sea-shore and in our marshes. It is common in the Antwerp market in winter. I have not had the opportunity of observing its habits.

DIVISION VII.

a. *Grallatores*.

Squacco Heron, *Ardea comata*. Three or four specimens have been shot in Belgium.

Black Stork, *Ciconia nigra*. Very rare.

Glossy Ibis, *Ibis falcinellus*. Extremely scarce.

Wood Sandpiper, *Totanus Glareola*. In marshy woods.

Black-winged Stilt, *Himantopus melanopterus*.

Little Crake and Baillon's Crake, *Crex pusilla* and *Crex Baillonii*.

Both very uncommon.

Grey Phalarope, *Phalaropus lobatus*. On the sea-shore and in marshes.

b. *Natatores*.

Egyptian Goose, *Anser Egyptiacus*. Two specimens have been shot.

Bewick's Swan and Mute Swan, *Cygnus Bewickii* and *Cygnus Olor*. Both seem to be birds of passage, the first is oftener met with in a wild state than the second.

Eider Duck, *Somateria mollissima*. Very seldom seen.

Barrow's Duck, *Fuligula Barrovii*. During cold winters.

Black-throated Diver, *Colymbus arcticus*.

Little Auk, *Mergulus alle*. Accidental passenger.

Gannet, *Sula alba*. Commoner than any other bird of the present division.

Little Gull, *Larus minutus*. A migratory species accidentally seen.

Common Skua, Pomarine Skua, and Richardson's Skua, *Lestris*

Cataractes, *L. pomarinus*, and *L. Richardsonii*. Seen after severe storms, generally in autumn.

Manx Shearwater, *Puffinus Anglorum*. On the coast.

Storm Petrel, *Thalassidroma pelagica*. Rather common after severe gales from sea.

The following birds are added to the list of occasional visitants, but I have never noticed them personally :—Long-tailed Duck (*Fuligula glacialis*), Roseate tern (*Sterna Dougallii*), Iceland Gull (*Larus leucopterus*), Buffon's Skua (*Lestris parasiticus*), and Forked-tail Petrel (*Thalassidroma Leachii*).

SUPPLEMENT TO THE WATER BIRDS AND RASORES.

Little Bustard and Great Bustard, *Otis tetrax* and *Otis tarda*. Both uncommon, and seen during the winter months on sandy heaths and in wild rocky spots. Scarcely ever in the centre of Belgium.

Lesser tern, *Sterna minuta*. Scarce. Only seen during the summer months.

Kittiwake Gull, *Larus tridactylus*. This species is not scarce on our sea-shores in winter; it never nestles here. In summer after severe storms and gales, young birds are seen many miles inland on rivers and ponds, even in Brabant in the neighbourhood of Brussels.

CONCLUDING OBSERVATIONS.

I have now terminated my notes on the Birds of Belgium, and I may observe that not many kingdoms of so small an extent can boast of a Fauna so varied as ours.

Belgium is so situated as to lie on the way of the numerous migrants which annually leave their breeding stations in the North to seek a more genial climate where no snow falls and food is plentiful, and its surface is so diversified, that nearly every species of bird (except such as frequent rocky shores) may find localities suited to their habits.

If we begin from our low and sandy shore, we meet first extensive and flat plains, of which some are highly cultivated, and some (especially in the province of Antwerp) present nothing else to the eye but a vast extent of sand and heath, which stretches all round as far as the horizon, being only relieved here and there by a solitary pine or larch.

Further on in Brabant and Hainaut the country becomes more wooded and hilly, and soon after entering the provinces of Namur, Liege, and Luxembourg, we find wild rocky heaths, and immense forests which have never yet been traversed by man, and in which the wolf, the boar, and the roe-deer roam about in unmolested liberty. Here also run solitary rivers, whose steep and craggy banks are filled with ivy-grown chinks and crevices, which seem to invite the wild-bird to come and nestle in them, promising them safety from the assaults of all their enemies. In other parts again are to be found immense and unwholesome reedy swamps and morasses interspersed with marshy woods and ponds, these also attract many species of wild-fowl which would otherwise never be seen in this neighbourhood.

It is easy to comprehend that in a country, of which the general features change so rapidly as they do here, no one man could observe with sufficient accuracy the numerous natural productions which occupy its surface and write anything like a complete natural history of them; each locality would need a persevering observer and describer of its own, and the united efforts of many would alone be able to compose such a work. (This is being done for Britain in a perfect manner through the medium of 'The Zoologist' and its numerous contributors). I only professed from the beginning, to furnish the readers of these lines with *notes* on the birds of Belgium, and I must beg their indulgence with regard to the incompleteness of these, both as regards facts and the number of species spoken of; but the subject was a very difficult one, and I have been obliged in the course of these papers to make use, largely and often, of Mr. De Selys' judicious observations on the Belgian Fauna, I have however seldom failed to verify his assertions, which I in every instance found to be perfectly correct.

I have noticed two-hundred and sixty-eight species of birds in this country, of which fifty-four only are truly indigenous; the remaining two hundred and fourteen being either birds of passage or of accidental appearance; of these, fifty-five come and nestle in spring and leave us in winter, twenty-seven pass the winter with us coming in autumn and leaving in spring; sixty-two are regular migrants but neither nestle nor hybernate here, and seventy-one are of accidental or irregular appearance; to this number may probably be added some twenty or thirty other species which will be discovered to occur occasionally on our coast or in our forests, and which have been found in neighbouring parts of France, Holland, or Germany.

I have been much flattered by the notice which has already been

taken of my first, and I fear, feeble essay on our Fauna, and I shall endeavour occasionally to forward some more of my observations, on the (until lately) much neglected natural history of Belgium, for insertion in 'The Zoologist.'

JULIAN DEBY.

Laeken, October 6th, 1845.

Additions to Mr. Hogg's 'Catalogue of Birds observed in South-eastern Durham and North-western Cleveland,' with some observations thereon. By W. BACKHOUSE, ESQ.

I have been interested in looking over the catalogue of birds referred to above, and having been a collector for several years in parts of this district, I find the following species omitted:—

The Nightingale, *Philomela lusciniæ*. A pair of these birds I am informed appeared near Darlington many years ago and were heard by several persons, they were at last taken by a bird-catcher.

The Lesser Whitethroat, *Curruca garrula*. Not uncommon near Darlington.

The Wood Warbler, *Sylvia sibillatrix*. Common in oak woods, particularly where there is a thick undergrowth.

Chiff-chaff, *Sylvia rufa*? This bird is not uncommon in woods to the west of this and near Durham, I do not recollect at present having actually seen it in the district strictly limited in the catalogue, but occurring on its borders, I include it in my list, as I think it almost certain to be found therein. The Grasshopper Warbler (*Salicaria locustella*) also occurs near Durham and to the west of this place, but being a much rarer bird, I will not without further evidence enumerate it.

Mealy Redpole, *Linota canescens*. I have met with specimens of this bird near Darlington.

Black-tailed Godwit, *Limosa melanura*. Occasionally met with about the Tees mouth in autumn.

Spotted Redshank, *Totanus fuscus*. I have a specimen of this bird from the Tees mouth.

Green Sandpiper, *Totanus ochropus*. Margins of rivers and brooks in autumn, but not common.

Wood Sandpiper, *Totanus glureola*. I had a specimen from the Tees mouth among the first I collected, which I believe was this bird.

One was shot at White Mare Pool near Sunderland, and is in the collection of my cousin, Edward Backhouse, Jun. of that place.

Black Tern, *Sterna nigra*. I have two specimens in the young plumage from a collector at Stockton, who informed me they were got in the Tees mouth.

Arctic Tern, *Sterna arctica*. Not so abundant as the common tern, but frequent in the Tees bay.

Roseate Tern, *Sterna Dougallii*. Occurs in the Tees bay, but rare.

Lesser Black-backed Gull, *Larus fuscus*. Common about the Tees mouth.

Arctic Skua, *Lestris parasiticus*. A specimen in the young plumage was obtained at Seaton by Edward Backhouse, Jun., it is much smaller than Richardson's Skua, and has a different cast of plumage to any of the numerous specimens of that species I have seen, the two middle-tail feathers which are partially elongated, are rounded at the end like the Pomarine Skua, though in the old state, they are very long and finely pointed.

The above fourteen birds, added to those already in the catalogue, makes the total number observed in the district 224. Selby has only 214 species, but since his list was published, many fresh species have been observed in the two counties. The only birds in Hogg's list which cannot be added to Selby's, as inhabitants of Northumberland and Durham, are the Black Woodpecker observed at Yarm, and the Rock Pigeon, if these latter are really the true wild species, and not escaped from dove-cots; of the Great Plover, which is not enumerated by Selby, I have seen a specimen which I was assured was shot in the high parts of this county, near the Moors. The following birds are in Selby's catalogue, but I am not aware of their having been observed in this district.

Snowy Owl, *Noctua erminea*. Rothbury and Elsdon, Northumberland, 1823.

Tengmalm's Owl, *Noctua Tengmalmi*. Near Morpeth, 1812.

Golden Oriole, *Oriolus galbula*. A female at Tynemouth, 1821.

Blue-throated Warbler, *Curruca suecica*. Newcastle Town Moor.

Grasshopper Warbler, *Salicaria Locustella*. Near Durham and western parts of that county.

Rose-colored Pastor, *Pastor roseus*. Near Durham and Chester-le-Street.

Roller, *Coracias garrula*. Near Howick and South Shields; I have a fine specimen shot near the Tyne.

Pine Grosbeak, *Pyrrhula enucleator*. Bill Quay, near Newcastle ; in my collection.

Little Bustard, *Otis tetrax*. Warkworth and Twizell, Northumberland.

Glossy Ibis, *Ibis falcinellus*. Near Rothbury ; a specimen shot to the south of Sunderland, is in the collection of Edward Backhouse, Jun.

Red-necked Phalarope, *Phalaropus hyperboreus*. Near Alnmouth ; Mr. Hancock of Newcastle has specimens from that coast.

White-eyed Pochard, *Fuligula Nyroca*. On the Tyne, near Herham.

Iceland Gull, *Larus Islandicus*. Holy Island.

Fork-tailed Petrel. *Thalassidroma Bullockii*. Benwell, near Newcastle.

The above fourteen, with the *Sylvia modestus*, shot on the Northumberland coast by John Hancock of Newcastle, will make the number for Northumberland and Durham 237 species.

I may mention the following among the rarer birds included in Hogg's catalogue which have come under my observation.

Gadwell and Garganey. I have a specimen of each of these from the Tees mouth.

Ivory Gull, Great Shearwater, Manx Shearwater. Specimens of these from the Tees mouth are in the collection of Edward Backhouse, Jun.

Velvet Duck. Several specimens met with in severe winters.

Fulmar. I have a specimen, found dead on a sand-bank at the Tees mouth ; in dissecting, I observed that the wind-pipe is divided by a septum into two channels for more than half its length.

Several specimens of the following birds have been met with from the Tees mouth, by Edward Backhouse, Jun. and myself:—

Goosander ; Red-breasted Merganser ; Black-throated Diver, young or winter plumage ; Slavonian Grebe, young or winter plumage ; Red-necked Grebe, young or winter plumage ; Pomarine Skua ; Glaucous Gull ; Pintail Duck.

WILLIAM BACKHOUSE.

Darlington, December 11th, 1845.

A Lady bit by an Adder.—On Tuesday morning, between eleven and twelve o'clock, Mrs. Jameson, a lady residing at Petersham, Surrey, was crossing the meadows from that place on her way to Richmond, when an adder that lay concealed in the grass, bit her on the foot, and by the time she reached her destination it had swelled most alarmingly. Mrs. Jameson obtained assistance at the nearest surgeon's

in the town, where the usual antidotes were applied with success." The foregoing is copied from the Northampton Mercury of Saturday, January 3rd, 1846. It is to me surprising that a viper should be found in the grass, and able to bite, on the 30th of December. If I resided in or near London I would go to Petersham to ascertain whether the accident happened or not, &c., and if it did, I would inquire into all the particulars and send them to 'The Zoologist.'—*John King; Buckingham, January 7th, 1846.*

P. S. I once had a couple of young vipers, not half-grown brought to me, caught at Ditchley, in Oxfordshire, on the same day, by the same person, and at a short distance from each other; one *brown*, the other *quite black*. They are now preserved in spirits, by Mr. George Sirett, chemist of this town. Some here will argue that the adder and viper are not the same, but different reptiles, and that the adder is much more active and dangerous than the viper.—*John King.*

Further remarks on the habits of the Eel.—There are one or two observations which I wish to make concerning Mr. Banister's letter (Zool. 1244) on my paper on the habits of the eel (Zool. 1216), contained in this month's Zoologist. The eels that I mention as having been taken by cutting a hole in the ice were not congregated round any aperture, but were simply lying under the surface of the ice some way from the edge which is usually the last to freeze, and the finding of this eel in the polecat's nest was, if I mistake not, (for as I said it was only from report I learnt it,) in September when the mode of fishing he suggests could not be practicable. In confirmation however of his assertion, that the animal in question feeds on frogs, I may mention that a friend, to whom I showed Mr. Banister's paper, told me that he remembered finding a polecat's store one winter, in which, as well as eels, there were a great many frogs.—*H. T. Frere; Aylsham, February 4th, 1846.*

Occurrence of the Tadpole Fish off Sherringham.—Within an hour after posting my last communication to you, I purchased in the Norwich market a fine specimen near a foot long of the tadpole-fish (*Raniceps trifurcatus*.) The person who sold it me said that it had been caught off Sherringham on the rock cod-lines, and that he had once before obtained a specimen which he had sold to Mr. J. H. Gurney. When I first purchased it, it was of an intense black, which has since faded to a dark grey on the head.—*H. T. Frere; Aylsham, January 30th, 1846.*

Memorandum of the Spawning of Trout.—Thinking that a notice of the periods of spawning of the trout in the rivers and brooks of Derbyshire, may prove acceptable to your readers, I give below the results as far as have occurred to me in my fishing excursions during the season.

DATE.	LOCALITY.	NO. OF FISH WITH SPAWN.	WT.
1844. June 22.	Little Eaton Brook.	2 fishes. Spawn size of a mustard-seed	$\frac{1}{4}$ lb.
„ July 10.	River Derwent.	1 fish. Spawn ready for exclusion.	$1\frac{1}{2}$
1845. April 2.	Findon Brook.	1 fish. Spawn ready for exclusion.	1
„ Aug. 18.	Longford Brook.	2 fishes. Spawn size of No. 6 shot.	$\frac{1}{2}$
„ — 25.	Markeaton Brook.	1 fish. Ditto ditto.	$\frac{3}{4}$
„ Sept. 18.	Driffield, Yorkshire.	20 fishes. Spawn size of No. 6.	$\frac{1}{4}$ to 1
„ — 22.	Longford Brook.	2 fishes. Spawn ready for exclusion.	$\frac{3}{4}$
„ „	Ditto ditto.	2 fishes. Spawn size of a mustard-seed	$\frac{1}{4}$

Robert John Bell; Mickleover House, January 10th, 1846.

Anecdote of a Crab.—When staying some years ago for a few months on the sea-coast of Sussex, I learnt from the fishermen there, rather a curious fact about the locomotive powers of the crab. Most of the Crustacea, we know, when found at low-water, can run, considering their size, at a very respectable pace; but whether they can go as fast under water, and how long they could keep in motion, are points not very easily determined. The fact I allude to, however, throws some light on the subject. The fishermen at Selsea, the place where I was staying, catch the crabs, &c. in wicker pots or baskets, something like a common kind of live mouse-trap. These they let down with a cord, attached to which are a given number of corks, which of course float on the surface of the sea, and serve to point out the position of the pot. After the fishermen have taken up all the pots, taken the crabs out of them, baited them, and sunk them again, they sail away homewards, and as they are going, one man is generally employed in binding up the claws of the lobsters with some willow-twigs to prevent their biting or injuring each other. But the crabs, not being so valuable, are prevented from quarrelling by making a small separation with a knife at the claw-joint, and sticking in, cruelly enough, a peg or wedge of wood,—a process which effectually puts a stop to anything like a pugnacious use of the limb. It often happens, however, that of the crabs which are caught, some are what the fishermen call out of season, and have their shells leathery and tough, in consequence, I presume, of the old shell having been recently cast off, and the new one not having, as yet, reached the usual healthy standard of crustacean induration. Such fish not being either eatable or saleable articles, are always thrown away, and pitched back again into the sea. It happened on one occasion that a female crab of this unprofitable kind was caught, but instead of being thrown overboard at once, or soon after being caught, was brought almost close to shore and then allowed to escape. The next time that the men went to take up their pots, most probably at the next day's low tide, or about twenty-three hours after she was first caught, they caught their old friend again. How they contrived to recognize her I do not remember now, but I recollect that at the time they managed to satisfy me that they could not be mistaken in supposing they had captured the same crab twice. The distance from shore to the fishing ground was ten or eleven miles; the intervening sea at some places a considerable depth, and at others very shallow, so that the traveller had to go up and down hill a good deal in her solitary journey. Moreover, the current, especially where the water was shallow, ran remarkably strong, so as to increase the length of the journey, in my opinion, by full half of what it would otherwise have been. This will make it about fifteen miles or so. The time it took her, I calculate in this way: since the tide gains one hour nearly in every day, there would be, as I said before, twenty-three hours between the two captures. Now three of these hours, we may safely conclude, were employed in taking up the pots, &c., and in the homeward voyage. This of course will just leave twenty hours for the crab's journey, supposing her, that is, to have regained her old station and gone into the old trap, almost immediately before the fishermen came and hauled up the pots again; she went therefore, at the slowest, fifteen miles in twenty hours, or three-quarters of a mile per hour. I do not know whether this is really an extraordinary pace, but for an animal of that size, walking sideways, and under water, where the resistance is so much greater than in the air, it appears to me more than we might have expected. It ought, also, I think, to be recollected that the crab was in an unhealthy state, and, therefore, most probably not so strong on its legs as it otherwise would have been, and that it had been, when it started, for some hours out of its natural element.

In any case, indeed, the fact seems to me deserving of attention: for suppose the crab did not employ the whole of the twenty hours in her journey, then she must have gone at a still greater rate of course. Suppose she *did*, and I think we must acknowledge that if she did not walk very fast, she walked a long while. Twenty hours at a stretch is very fair for a crab. The story suggests, too, some other odd speculations. How did she find her way back? What made her go? Want of food anywhere else? Or love of home, perhaps, and fatherland,—a kind of submarine *Nostalgia*? Moreover, it shows (what we might naturally have expected, indeed), great imprudence on her part and very culpable indocility to have profited so little by her recent danger and escape.—*W. S. Lewis; Cotham Hill Villa, West Clifton, January, 1846.*

[In this instance does it not seem probable that the fishermen found two crabs of a similar size and sex, and also similarly circumstanced as regards the recent ecdysis?—*Edward Newman*].

Pisidium pusillum attracted by the skull of a Fox.—I have much pleasure in sending an account of a circumstance which has lately come under my notice. In the beginning of this month, while staying at Tregeare, near Launceston, I amused myself by cleaning the skull of a fox, and to do this the more easily, I soaked it in water for a day or two. At the end of the second day, when I took the bone out of the water, I noticed upon it a few specimens of *Pisidium pusillum*. Thinking that it might be an accidental occurrence, I replaced the bones, and after two days I again examined them, when to my surprise, I found them literally covered with these minute shells. I counted upwards of forty, but should think that the number on the whole skull could not have been far short of two hundred. I have often found them by twos and threes clinging to stones, never before in any larger quantity than three, or four at the most. There have been lately many interesting notices in 'The Zoologist' of the carnivorous propensities of different mollusks. I am inclined to think that this circumstance goes far towards a proof that this little *Pisidium* by no means despises a rich and savory meal. The stream in which I found them was about eighteen inches broad and about four deep, being merely a drain by the side of a hedge, half filled with dead leaves, and often dry during the summer months. Unless they are absolutely swarming, some must have come from a distance to enjoy the treat. But how they found it out is to me a mystery; especially as they had collected in the short space of four or five days.—*R. L. King; Grammar School, Truro, January 29th, 1846.*

Descriptions of Ten New British Moths. By J. W. DOUGLAS, ESQ.

SUGAR and assiduous collecting have within the last few years made the majority of the larger British Lepidoptera well known, and specimens more abundant, so that, comparatively, little remains to be done among them, except in new localities. But the smaller moths still offer a wide field for research, and judging from the number found

during the present and two preceding years, I believe that a great number of species yet remain to be discovered, even in our most frequented districts, while in Scotland, Ireland, and many parts of England, a Tortrix or a Tinea has scarcely been looked for. What may be done in a new locality, let the collection made by Mr. Weaver in Scotland this year, witness,—a collection of rarities, I suppose, never before equalled in Britain by one person in one year. Having, therefore, searched the works of Hübner, Duponchel, &c., without finding more than two of the ten following species; I have thought it better to describe them, than to let them add to the mass that I believe a few years will produce. I possess and know of several other apparently new species, but as I have not searched the continental books to see if they are there described, I have left them for the present.

Family.—TORTRICIDÆ, *Stephens*.

CNEPHASIA CONSPERSANA, *Douglas*. (Fig. 1).

Expansion of wings 8 lines. Anterior wings luteous, sprinkled all over with griseous atoms, and a very slight trace of a fascia in certain lights; posterior wings griseous: head luteous: thorax and body dusky.

I took three specimens on the salt-marshes, near St. Osyth, Essex, in July last. Two of them agree with the above description, but the third has the anterior wings all griseous sprinkled with darker colour, and a larger series would probably show greater variations, but the species cannot be confounded with any other.

PÆCILOCHROMA OCCULTANA, *Douglas*. (Fig. 2).

Expansion of the wings 9 lines. Anterior wings cinereous, lighter towards the inner edge and near the apex, sometimes forming two irregular spots, with an angular patch at the base, and an oblique fascia beyond the middle, darker; posterior wings fuscous: head, thorax, and abdomen cinereous or fuscous.

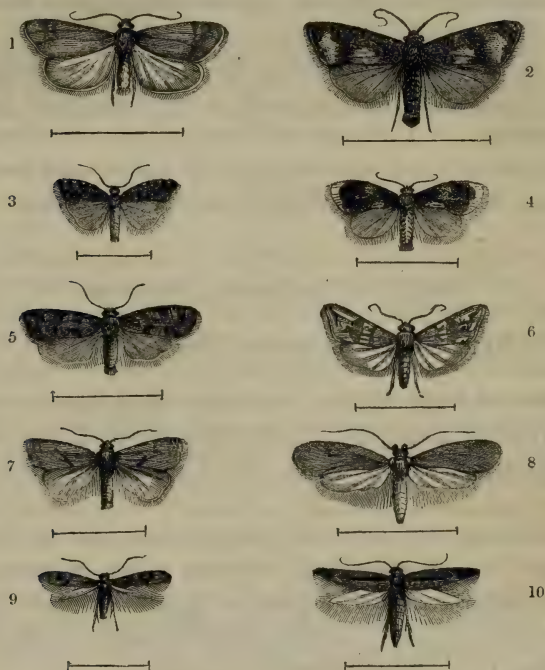
I have three specimens of this insect, two taken at Birch-wood, on the 2nd of July, and one at Weybridge in June, all out of fir-trees. It is also in the cabinets of Mr. Bentley and Mr. S. Stevens.

SERICORIS TENEBROSANA, *Douglas*. (Fig. 3).

Expansion of wings 4 lines. Anterior wings cinereous, with a

large, somewhat angular patch at the base, a fascia beyond the middle, extending half the breadth of the wing from the lower edge, and a patch at the apex fuscous; on the costa are four pairs of small white spots; posterior wings fuscous: head and thorax luteous.

Of this small, but distinct species, I have but one specimen, which I took in June last by beating a spruce fir at Weybridge.



1. *Cnephasia conspersana*. 2. *Pecilochroma occultana*. 3. *Sericoris tenebrosana*. 4. *Argyrotoza* Audouinana. 5. *Orthotænia quadrana*. 6. *O. venustana*. 7. *Cochylis affinitana*. 8. *Depressaria rotundella*. 9. *Anacamptis lophyrella*. 10. *A. instabilella*.

ARGYROTOZA AUDOUINANA. (Fig. 4).

Argyrolepia Audouinana, Duponch. Pl. 266, Fig. 5.

Expansion of wings about $4\frac{1}{2}$ lines. Anterior wings dark coffee-brown, with the extremity of a golden yellow, and two spots of the same colour placed, one nearly in the centre of the costa, the other near the base on the lower edge; on the brown part are several metallic blue lines: the under side is light brown with the extremity yellowish: the posterior wings are light brown on both surfaces, with the fringe lighter: head, thorax, and antennæ light brown, palpi orange-yellow.

Of the above insect I took two specimens at Black Park on the 28th of June last, and one was also taken by my friend Mr. Farr at the same time. There are also two in the cabinet of Mr. Bentley from the collection of Mr. Stone, but I do not know where they were taken.

ORTHOTÆNIA QUADRANA. (Fig. 5).

Tortrix quadrana, Hub. Tort. Fig. 223. *Sciaphila quadrana*,
Trietschke, vol. viii. p. 169.

Expansion of wings 5—7 lines. Anterior wings cinereous, crossed by two darker fasciæ, one before and the other behind the middle, with several dark marks on the costa and towards the apex; posterior wings dusky: head and thorax griseous. These characters vary greatly, no two specimens being exactly alike either in colour or marking, and in some the fasciæ are nearly obsolete.

This species I first took on the 24th of July, 1842, on the Downs near Sanderstead, and again at West Wickham on the 27th of May this year, so that it would appear to be double-brooded. It has also been taken at Stoat's Nest by Mr. Stainton, and on the Downs in Sussex by Mr. S. Stevens. It is said to feed on *Scabiosa arvensis*, which is not improbable, as that plant grows commonly where the insect has been found.

ORTHOTÆNIA VENUSTANA, *Douglas*. (Fig. 6).

Expansion of wings 6 lines. Anterior wings luteous, with a small patch at the base, two irregularly formed fasciæ, and an oblique mark from the apex towards the centre of the wing, and the cilia, brown; posterior wings dusky: head and thorax luteous.

I took one specimen on the salt-marshes near St. Osyth in Essex, on the 7th of July last, and I cannot find it in any other collection.

COCHYLIS AFFINITANA, *Douglas*. (Fig. 7).

Expansion of wings 6 lines. Anterior wings varying in colour from light yellow to dull brown; about the middle, springing from the inferior edge, is a curved darker fascia, extending half-way across the wing, and some small markings towards the apex and on the costa; cilia yellow; a deep furrow extends from the base to about

two-thirds of the length of the wing, where it terminates abruptly ; posterior wings dusky.

This moth I found on the salt-marshes near St. Osyth, Essex, on the 8th of July last. It is nearly related to *C. griseana*, *Haworth*, and to *C. vectisana*, *Westwood*, whence the name I have given to it.

Family.—YPONOMEUTIDÆ, *Stephens*.

DEPRESSARIA ROTUNDELLA, *Douglas*. (Fig. 8).

Expansion of wings 7 lines. Anterior wings much rounded at the apex, of a luteous yellow tinged with griseous, having two distinct black dots in the centre about a line apart ; posterior wings dusky : head and thorax luteous.

Of this very distinct species I have two specimens, one taken near Mickleham, the other near Sanderstead, both in September. There is also a specimen in Mr. Bentley's collection.

ANACAMPSIS LOPHYRELLA, *Douglas*. (Fig. 9).

Expansion of wings $5\frac{1}{2}$ lines. Anterior wings narrower, ferruginous, each with five black tufts placed, one at the base, one before the middle, two about the middle contiguous to each other and across the wing, and one beyond : there are also several very minute tufts near the apex ; between the first and third tufts the lower edge of the wing is luteous : posterior wings, head, and thorax dusky. Taken at Sanderstead in hedges in July.

ANACAMPSIS INSTABILELLA, *Douglas*. (Fig. 10).

Expansion of the wings 7 lines. Anterior wings luteous or ochraceous ; a lighter transverse striga near the apex, a line down the centre and several spots variously placed darker ; posterior wings dusky : head and thorax luteous.

This insect was by no means uncommon on the salt-marshes near St. Osyth, Essex, in July, but when they rose from the herbage the wind blew so strongly that it was no easy matter to catch them. It is a species that varies exceedingly both in colour and marking, but none of the varieties approach any hitherto named species.

J. W. DOUGLAS.

6, Grenville Terrace, Coburg Road, Kent Road,
November 15th, 1845.

Habits of Melitæa Cinxia. By the Rev. J. F. DAWSON.

As this Fritillary is rare in almost every part of the kingdom, some account of its favorite haunts and habits may not prove uninteresting. It cannot be accounted by any means common here, being confined to a few localities only, though where it does occur, it is in general to be found in some abundance. It is not to be expected in cultivated districts, but breeds on steep and broken declivities near the coast, which the scythe or the plough never as yet have invaded, and in such spots it may be met with earlier or later in May, according to the season. Near Sandown, on the side of the cliff, there is one of these broken declivities, occasioned by some former land-slip, covered with herbage, which slopes down to the beach. A pathway leads to the base. On the 9th of May, 1844, a hot, sunny day, each side of this pathway was completely carpeted with a profusion of the yellow flowers of *Anthyllis Vulneraria* (var. *maritima*), when I visited the spot; and these flowers were the resort of an abundance of these Fritillaries which fluttered about them, or rested on their corollas, expanding and sunning their wings, and presenting a most charming picture of entomological loveliness. The great abundance of the narrow-leaved plantain, which also grows there, affords food for their larvæ. The spring of *last* year, on the other hand, was so very backward, that on visiting that locality at a date some fortnight later than the above, so far from either flowers or butterflies being visible, the larvæ were still feeding, and I could discover but few chrysalides. These latter are found adhering, just above the surface of the ground, to the knotted stems of the plantain, which here consists of aged plants, each with but a few stunted leaves; and occasionally on the under-side of large stones, which have fallen from the cliff; and they are suspended and partly surrounded in the latter case with a fine web. They are also generally to be found in *pairs*. The caterpillars evidently prefer these stunted plants, for at the base of the declivity, where the plantain grows luxuriantly, not one is to be seen. They are black and spiny, with *red heads and legs*: being hatched in August, they pass the winter in societies, under a kind of tent, formed by a compact web, brought round and over the stems of grasses. I have found several of these societies on the 27th of August, the individuals which composed them being about a quarter of an inch long, rolled up like little balls. All these societies occurred at the *base* of the declivity, where the herbage grows most luxuriantly; and when the caterpillars have attained sufficient strength in the spring, they are invariably seen ascending to-

wards the *higher* parts of the slope. And herein I imagine that I recognize a beautiful instance of natural instinct, both in the butterfly and caterpillar: the former deposits its eggs low down the declivity, where the young brood may rest most securely sheltered and least exposed to the wintry storms, but when the caterpillars are sufficiently advanced in growth, they ascend to the higher parts of the steep to feed and undergo their transformation: were the chrysalis formed *below*, they would probably have too much moisture and too little sun; whereas by being formed higher up they have a sufficiency of both to bring them to maturity.

This butterfly is single-brooded; but there is a succession of them, varying in duration according to the season. The earliest dates on which I have met with it is May 1st, the latest in July; but in the latter case the specimens were bred in captivity. I never remember to have seen it so late in the state of liberty; not later indeed than the middle of June here. They are very difficult to rear from the larvæ, and those that I have bred, are not only disclosed much later than in the state of freedom, but are not nearly so fine and perfect. They in general fly slowly and peacefully, except when alarmed, gliding gently from flower to flower. I have taken as many as two dozen without moving from the spot where I stood, as they successively visited the stems of the grasses round me.

This Fritillary was much less plentiful last season than heretofore; and in some of its former haunts has quite disappeared. It has many foes: for besides the march of improvement in cultivation which gradually invades its haunts, the same natural causes which promote its abundance, also multiply its enemies. *Silpha obscura* and *tristis* destroy the larvæ: and a large ground spider, very numerous in the spots which it frequents, feeds on the perfect insect; it lies in wait till the butterfly alights upon the low plants, or on the ground, then rushing forward, seizes it by the neck, and holds it captive with such tenacity, that both insects may almost be pulled in pieces, ere it will relax its grasp.

J. F. DAWSON.

Ventnor, January 12th, 1846.

Migration of Butterflies.—By the assistance of friends and correspondents in different parts of the island, we have been enabled to trace the course taken by the white and yellow butterflies in their annual migration. They were seen crossing the Kandian mountains all in the same direction, varying slightly from south-west, and simulta-

neously at so many places that the column must have been at least thirty or forty miles in breadth. They thus continued their route until they arrived at the sea-coast, but how much further south than Calcutta we are not informed, as they were here seen coming northward, and, as we formerly announced, passing Columbo, till we finally hear of them at Jaffnapatam, where a friend informs us "they passed in droves on the 20th instant. Their course was west some degrees north. Their colour was that of those you described (white, light-yellow, and some brown). They had not far to go to the sea. Whether they were all drowned there or not remains to be learned." It would now appear that these little winged pilgrims leave the east coast of Ceylon on the setting in of the north-east monsoon, or rainy season, and, crossing the island, travel along the sea-coast until they reach the northern extremity, when they pass over the strait to the opposite continent of India. As the eastern coast of the continent is also exposed during the present monsoon, it is not improbable that the butterflies continue their journey a considerable distance inland, or perhaps even go across to the western or sheltered coast of India; and if our Madras contemporaries will make inquiries amongst their Indian readers, this most interesting subject may be successfully pursued. This description of butterfly is thus seen taking the same course annually at the same season, but is not known to return. The question then arises what maintains the annual supply, as the butterflies which leave Ceylon are not seen to return, at least by the same route. It may be that they deposit their eggs before starting on their journey, so that the transformations may take place in the wet season, when vegetation is vigorous and most suitable for the support of the grub; and the chrysalis may be matured and the young butterfly come forth on the return of fine weather. We remember to have seen about ten years ago a similar migration of butterflies, but of quite a different description (they being speckled black on a bluish ground as well as we can recollect) along the valley of Badula.—*Colombo Observer*.

Winter appearance of Vanessa Urticæ.—I think the following fact is worthy of being recorded in 'The Zoologist.' On the 24th of December last, a specimen of the small tortoise-shell butterfly (*Vanessa Urticæ*) was captured on Blackheath in excellent condition. A few days afterwards some workmen, who were removing gravel in my field, found a peacock butterfly (*Vanessa Io*), which had secreted itself below the surface of the ground.—*William Marsh; Morden College, Blackheath, January 15th, 1846*.

Graphiphora renigera.—Several seasons back, I first discovered *Graphiphora renigera* (*Steph.*) flying in considerable numbers, about the middle of August, on a stony part of Arthur's Seat, but so wasted by the weather, that I was unable to determine the species. In the month of February of last year, I picked up under a stone, near the same spot, a larva with which I was unacquainted. It changed to a pupa in April, in a slight folliculus formed by drawing some leaves together at the bottom of the box; and at the end of June the moth appeared, and turned out to be *Graphiphora renigera*. This led me to look out for it earlier; but I found none till the end of July, when it reappeared in its former locality, and in fine condition. Although by no means scarce, as several might be seen flying in the hot sunshine at the same instant; yet from their extreme swiftness, and the rough nature of the ground, I was only able to capture about a dozen specimens. Among these there was not a single female, and I rather suspect this sex does not fly during the day, but remains concealed among the stones, as I frequently observed the males alighting, and entering the crevices. This interesting species also flies at dusk; as I took a specimen resting on some candy-tuft,

about eleven o'clock, P. M., at some distance from the place which it generally frequents.—*R. F. Logan ; Duddingstone, near Edinburgh, January 26th, 1846.*

Psychophora trepidaria.—Schehallian Mountain was the only locality known for this moth: I believe it was first taken by Dr. Hooker: and on the 11th of July, nearly twenty years ago, Mr. Dale took a single specimen, and on the 28th of June, 1844, I took another. In my late excursion into Scotland I had the good fortune to discover another locality on a mountain five or six miles from Schehallian, and to take specimens on all the following dates, June 13th, 14th, 15th, 16th, 23rd, 25th, 30th, and July 8th. The best time for capturing these moths is when the sun shines a little, but the weather is otherwise cold; they may then be seen running over the surface of the moss: when approached, they almost invariably ran in among moss, which was nearly of their own colour, and secreted themselves. The females were much more rare than the males. I obtained many eggs, but did not succeed in rearing any of them. The larva probably feeds on heath, or on the soft moss which grows in abundance on the hills inhabited by this insect, at an elevation of four thousand feet above the level of the sea.—*Richard Weaver ; 9, Vine Street, Birmingham.*

Description of Perga scabra, an Insect belonging to the order Tenthredinites and the class Hymenoptera. Colour brown, the legs being paler than the body. The head is of nearly equal width with the prothorax and semi-porrected: the ocelli are placed in a triangle, the base of which is much longest, the anterior ocellus being but little in advance of the other two; every part of the head is rendered scabrous by irregular, deep, and often confluent punctures; the vertex has moreover two vague longitudinal depressions, and between them a slight central longitudinal sulcus terminating at the anterior ocellus: the antennæ are remarkably short even for the genus; when extended laterally, they scarcely reach beyond the eyes. The prothorax is sculptured in the same manner as the head, and has various depressed spaces and elevated ridges, all of which have a longitudinal direction. The abdomen is glabrous, its extremity much recurved. The wings partake of the brown colour of the entire insect. The length varies from .5 to .6 of an inch. Inhabits Australia. The specimens from which my description is made were captured by Lieutenant I. M. R. Ince, R. N., and most obligingly handed me for examination by Mr. W. H. Ince, together with many other very interesting insects, which I find have been previously described.—*Edward Newman.*

Description of the British Species of Bees comprised in the Genera Colletes of Latreille and Macropis of Klug ; with observations on their Economy. By FREDERICK SMITH, Esq., Curator to the Entomological Society.

THE interesting economy of *Colletes* has attracted the attention of various authors, but their history as detailed by Reaumur is the most ample and correct, and is quoted at some length by Mr. Kirby in his

'*Monographia Apum Angliæ.*' I shall therefore give the result of my own observations merely as confirmatory of the history referred to. I have observed the economy of three of the species, and I find that all of these are more or less gregarious. The most extensive colonies which I have met with, are those of *Colletes Daviesana*, a local, but most abundant species: it occurs frequently in Kent, burrowing in banks composed of a hard dry sand, and so numerous are some colonies, that these banks are completely riddled with their burrows, which upon examination are found to be about ten or twelve inches in length. At the extremity, the insect lines the tube for about three-quarters of an inch with a very thin transparent membrane, closely resembling gold-beater's skin; this serves to contain the liquid mixture of pollen and honey which she next collects; having filled the cell, she deposits an egg, and then closes it up, the closed end being concave and the further extremity convex. She constructs from four to five or six of these thimble-shaped cells, the convex end of one fitting admirably into the concavity of the other. The eggs are hatched in three or four days, and the larva is full-fed in about eight or nine days afterwards: from this time it remains in a lethargic state until the following spring, when it assumes the pupa state about May, and appears a perfect insect about the end of June, or beginning of July. The economy of *C. fodiens*, and also of *C. succincta*, is precisely similar; with that of *C. marginata* I am not acquainted. Reaumur says that they construct their nests in the earth which fills the vacuities of stone walls, which, although contrary to their usual habit, I think very probable, since I always find them choosing hard, dry sand-banks; but whether the bee recorded by Grew in his '*Rarities*,' as forming its nest in the pith of an old elder-branch, belonged to this genus, I think extremely doubtful, although Mr. Kirby conjectures it to have been identical; but Mr. Kirby states that he had never met with their nidi himself.

As far as my observation enables me to determine, we have four British species of this genus, the *Apis succincta* of Linnæus being the type. A specimen of this species still remains in the Linnean cabinet, and although extremely distinct from its congeners, does not appear to be sufficiently discriminated from the other species of the genus, all bearing a very close resemblance. I shall therefore endeavour to point out such specific differences as will serve to separate them with greater facility.

Which species may have been that described by Fourcroy, and named by him *Apis fodiens*, it is impossible to determine, since the

description of that author would equally well suit either of the species. It, however, fortunately happens that the species selected by Mr. Kirby, and also by St. Fargeau, are distinct from the Linnean species *succincta*, and *marginata*, although the description of the latter author would also be equally applicable to all.

Genus.—COLLETES, *Latreille*, *St. Fargeau*, *Curtis*.

Apis, Linnæus. *Melitta*, Kirby. *Evodia*, Panzer. *Andrena*, Fabricius.

Generic characters. Ocelli placed in a curve: tongue short, bilobed at the apex; labial palpi 4-jointed; maxillary palpi 6-jointed: wings with three complete submarginal cells.

Sp. 1. COLLETES SUCCINCTA, *Latreille*.

Female. — (Length $5 - 5\frac{1}{2}$ lines). Black, the clypeus naked, roughly punctured, the punctures uniting and forming striæ towards the apex, the rest of the face clothed with pale fulvous pubescence, and the cheeks with white; the apical joint of the antennæ piceous beneath. The thorax above clothed with fulvous hair, beneath, as well as all the coxæ and femora, with white; the pubescence on the tibiæ and tarsi is very pale ochraceous. The abdomen is convex and shining, the first segment is very closely and finely punctured, and its margin rufo-piceous, the remaining segments are also closely but more delicately punctate, the first segment is pubescent at the base, the pubescence forming lateral patches, the second segment has a white fascia both on its basal and apical margins; the apical margins of the rest have a white marginal fascia; the segments beneath have also a white marginal fascia.

Male. — (Length $3\frac{1}{2} - 4\frac{1}{4}$ lines.) Black, the face below the antennæ clothed with pale fulvous hair, the cheeks with white; the pubescence on the thorax is fulvous above, paler on the sides, and nearly white beneath; that on the femora is of the same colour, the thin clothing on the tibiæ and tarsi is pale fulvous. Abdomen oblong, convex, and shining, the first segment deeply and closely punctate, the rest more finely so; all the segments have entire white marginal fasciæ.

This species most closely resembles *C. fodiens*, but may be distinguished by the rufo-piceous margin of the first abdominal segment, by the abdomen being very smooth and shining, delicately punctured,

and by the fasciæ being quite white. This bee is plentiful at Weybridge, where it frequents the purple heath; I have also found it in similar situations in Hampshire, and have received it from the Isle of Wight, and from Sussex. I have not met with it in the immediate vicinity of London.

Sp. 2. COLLETES FODIENS, *Latreille*.

Female.—(Length 4 to $4\frac{1}{2}$ lines). Black, the face clothed with pale hair; the antennæ nigro-piceous beneath; the cheeks have a pale pubescence, that on the thorax above is fulvous, and on the sides and beneath, it is nearly white; as is also the fringe on the femora. The abdomen is not shining, the first segment is deeply, and the rest more finely punctate, the puncturing being so close as to give the abdomen an opaque appearance; all the segments have an entire fascia of pale fulvous hair.

Male.—(Length $3\frac{1}{2}$ to 4 lines). Black, the face clothed with pale fulvous hair. The thorax above clothed with a somewhat fulvous pubescence, that beneath and also the fringe on the femora nearly white. Abdomen rather coarsely punctured, with a thin pale pubescence, all the segments have a pale marginal fascia.

The sculpture of this species will serve at once to distinguish it; the exceedingly close punctation on the abdomen has a brownish hue, and is not black and shining as in *succincta*. This bee appears to be very generally distributed; and although I have found its nests, I never observed it to form large colonies.

Sp. 3. COLLETES MARGINATA.

Apis marginata, Linnean Cabinet.

Female.—(Length 4 lines). Black, the clypeus deeply punctured, with a thin fulvous pubescence, more dense along the margins of the eyes. The thorax above, clothed with a thin fulvous pubescence, that on the sides and beneath being paler; all the legs are thinly clothed with a similar pubescence. The abdomen shining, the basal segment rather deeply, the rest more finely punctate; the base of the first segment has a pale fulvous pubescence, which is also the colour of the fascia on the margins of all the segments.

Male.—(Length 3 lines). Black, the face densely clothed with pale yellow hair: that on the thorax is thin, and of the same colour, as it is also on the legs; the claws rufous. The abdomen rather deeply,

but not closely punctured, all the segments have a white marginal fascia.

This species is much smaller than the rest, which alone would serve to distinguish it; in general appearance it most closely resembles *C. succincta*, but it wants the rufo-fuscous margin of the first segment of the abdomen; and it is not so bright and shining, nor are the fasciæ white in the female.

This bee I never captured. I have specimens of both sexes taken by Mr. Samuel Stevens at Little Hampton, Sussex, and presented to me by that gentleman. I have compared this species with the specimen in the Linnean cabinet, and find them identical. The male was not previously known, nor have I seen any specimens excepting my own, and the one referred to.

Sp. 4. COLLETES DAVIESANA.

Melitta Daviesana, Kirby, MSS.

Female.—(Length 4—4½ lines). Black, the clypeus thinly clothed with pale fulvous hair, gradually becoming darker towards the vertex; the thorax thinly clothed with fulvous hair above, beneath with white; the fringe on the femora, and also the thin pubescence on the tibiæ and tarsi similar. Abdomen very smooth and shining, and very finely punctured, the basal segment rather more deeply, but more distantly punctured, the margins of the segments have a pale ochraceous fascia; the first usually more or less obliterated.

Male.—(Length 3½ to 4 lines). Black, the antennæ nigro-piceous beneath; the face densely clothed with pale fulvous hair, paler on the clypeus; the thorax above clothed with fulvous, and beneath with white hair; the abdomen oblong, punctured, the margins of the segments slightly depressed, and having a very pale ochraceous fascia; beneath, the fasciæ do not continue along the margins of the segments, but curve upwards from the lateral margins, not uniting in the centre.

This species I think cannot be confounded with either of the others: its black, glossy abdomen, so delicately punctured as not to be observed without a lens, together with the interrupted fasciæ, will serve to distinguish it.

The males of this genus may perhaps be found most difficult to separate; that of *marginata* is usually larger than the others, its abdomen very convex, and its fasciæ the most white and even, with no pubescence between them. The male of *fodiens* has the abdo-

minal fasciæ less white, and there is a thin pale pubescence between them. The male of *Daviesana* may be known by examining the abdomen beneath, where the marginal fasciæ curve upwards as described. The male of *marginata* is so much smaller than the rest, that size would point it out; it approaches most to that of *Daviesana*, but the fasciæ are continued along the margin of the segment on the under side of the abdomen.

Genus.—MACROPIS, *Klug*.

Andrena, Latreille. *Scapter*, St. Fargeau. *Megilla*, Fabricius?

Generic characters.—Maxillæ slightly bent, the terminal lobe oval, lanceolate, slightly pubescent; maxillary palpi six-jointed, the labium straight; labial palpi four-jointed; mandibles obtusely unidentate. Antennæ filiform in the male, subclavate in the female; ocelli disposed in a slight curve. Wings with two submarginal cells; posterior tibiæ of the female furnished with a densely pubescent pollen-brush.

The single species of which this genus is composed, is described by M. Leon Dufour in the seventh volume of the 'Annales de la Société Entomologique de France,' as belonging to the genus *Megilla* of Fabricius, and the present species he considers to be identical with the *Megilla labiata* of that author (Syst. Piez. p. 333); but a reference to the description creates in my mind such doubts, that I hesitate to coincide in opinion with that eminent naturalist. *Macropis labiata* is figured by Panzer, but I cannot find that Klug has established the genus in his own works. Panzer informs us, that Klug transmitted the insect to him, together with the generic appellation of *Macropis*. Dufour also transmitted the species to Latreille, thirty years previous to publishing his own paper in the 'Annales,' and in the 'Genera Crustaceorum et Insectorum,' (*Lat.*), we find the present species described as the type of a sub-division of that author's genus *Andrena*, having two sub-marginal cells; the true *Andrenidæ* having three. This character alone would be sufficient to separate it from *Andrena*, and I have accordingly adopted the generic appellation of Klug. The genus is closely allied to *Dasypoda* in having two sub-marginal cells, the ocelli placed in a slight curve, and in having a stout spine on the anterior tibiæ.

Species.—MACROPIS LABIATA, *Klug*, *Panzer*.

Andrena lagopus, *Lat.*

Female.—(Length 4 lines). Black, the face thinly clothed with

griseous hair; antennæ nigro-piceous beneath, mandibles black, ocelli placed in a curve. Thorax closely and deeply punctured, slightly clothed above with brownish hair, and with paler beneath; the posterior tibiæ densely clothed with white hair, slightly stained with brown at their apex, first joint of posterior tarsi clothed with black hair; the remaining joints, as well as the whole of those of the anterior and intermediate tarsi, rufous beneath. Abdomen globose, very smooth and shining, the third and fourth segments have a white marginal fascia, the first interrupted, the fifth segment has a brown fascia.



Macropis labiata. a. Male. b. Female. c. Face of the Male. d. Anterior leg of Female.

Male.—(Length 4 lines). Black, antennæ nearly as long as the head and thorax, scape with a yellow spot at the apex beneath, the remaining joints testaceous beneath; mandibles black, with a yellow spot at the base, face below the antennæ yellow. The thorax has a thin fulvous pubescence above, and a thickish fringe round the apical margin of the scutellum; the metathorax, laterally, has a rather dense pale pubescence; the legs beneath have a thin scattered bright fulvous pubescence; the anterior and intermediate tarsi above, are clothed with bright pale fulvous hair; all the claws rufous; the posterior femora and tibiæ incrassate, the latter clothed with a short pale fulvous pubescence, the tarsi beneath, with bright fulvous; the abdomen globose very shining, rather deeply punctured, the margin of the third segment has an interrupted pale fulvous fascia, the three following have an entire fascia.

The economy of this rare species is not known. Dufour informs us that it has been captured in the environs of Saint Sever, frequenting aquatic plants, particularly the flowers of *Alisma Plantago*, or common Water-plantain. The female has not hitherto been captured in this country. There is a specimen of the male in the collection of British bees in the British Museum, having a label attached, giving the locality of Leicester. The next specimen was captured by Mr. Walton in the New Forest, and is now in the collection of Mr. Desvignes; and in July, 1842, Mr. Samuel Stevens captured another at Weybridge, and I am indebted to that gentleman for the specimen now in my collection. I have been induced to publish a figure of each sex, in the hope that the insect may be recognised, should it fall in the way of collectors not familiar with the order to which it belongs. The figure of the female is drawn from a foreign specimen in the cabinet of the British Museum.

FREDERICK SMITH.

Oak Apples of America.—By the following description of the galls of North America, extracted from Dr. Harris's 'Insects of Massachusetts,' it will be seen that the oak-apples of that country are very different from those of Europe. "The eggs of some gall-flies do not hatch till the galls begin to grow hard on the outside; this is the reason why we do not find any insects within certain kinds of galls, so long as they remain soft and unripe. Of this description are the galls called swamp-apples and cedar-apples. The former grow on the small twigs of the swamp-pink, or *Azalea viscosa*; they are irregular in shape, of a greenish white colour, and fleshy consistence, like an apple, and are sometimes eaten, but are rather too astringent to be pleasant. Cedar-apples are found on the twigs of the red cedar (*Juniperus Virginiana*); in their unripe state they are large, irregular, and coarsely fringed lumps, of an orange colour, and as soft as jelly; they afterwards shrink, become hard and round, and the thick fringe-like projections on their surface shorten, and take the appearance of leathery prickles. They have been given as a medicine to expel worms; and their efficacy, if they really have any, probably depends upon the resin and oil peculiar to the tree which gives to the galls, even when dried, somewhat of a turpentine smell. The largest galls found in this country are commonly called oak-apples. They grow on the leaves of the red-oak, are round and smooth, and measure from one inch and a half to two inches in diameter. This kind of gall is green and somewhat pulpy at first, but, when ripe, it consists of a thin and brittle shell, of a dirty drab colour, enclosing a quantity of brown spongy matter, in the middle of which is a woody kernel about as big as a pea. A single grub lives in the kernel, becomes a chrysalis in the autumn, when the oak-apple falls from the tree, changes to a fly in the spring, and makes its escape out of a small round hole which it gnaws through the kernel and shell. This is probably the usual course, but I have known this gall-fly to come out in October. The name of this insect is *Cynips confluentus*. Clusters of three or four

round and smooth galls are often seen on the small twigs of the white oak. They are nearly as large as bullets, of a greenish colour on one side, and red on the other. They approach in hardness to the Aleppo galls, and perhaps might be put to the same use. Each one is the nest of a single insect, which turns to a fly and eats its way out, in June and July, having passed the winter as a chrysalis, within the gall, lodged in a clay-coloured egg-shaped case, about three twentieths of an inch long, and with a brittle shell. These little cases appear to be cocoons, but are not made of silk or fibrous matter. Similar cocoons are found within many other galls, and I have some which were discovered under stones, and were not contained in galls, but produced gall-flies, the insects having left their galls to finish their transformations in the ground. The name of the gall-fly of the white oak is *Cynips oneratus*, *Harris*. Galls of the size and colour of grapes are found on the leaves of some oaks. Each one contains a grub which finishes its transformations in June. The winged insect is my *Cynips nubili-pennis*. One of our smallest gall-flies may be called *Cynips seminator*, or the Sower. She lays a great number of eggs in a ring-like cluster around the small twigs of the white oak, and her punctures are followed by the growth of a rough or shaggy reddish gall, as large sometimes as a walnut. When this is ripe, it is like brittle sponge in texture, and contains numerous little seed-like bodies, adhering by one end around the sides of the central twig. These seeming seeds have a thin and tough hull, of a yellowish colour; they are egg-shaped, pointed at one end, and are nearly one-eighth of an inch long. The gall-insects live singly, and undergo their transformations, within these seeds; after which, in order to come out, they gnaw a small hole in the hull, and then easily work their way through the spongy ball wherein they are lodged. It has been observed that no tree in Europe yields so many different kinds of galls as the oak. Those which I have described are not all that are found on oaks in this country, and they seem to be sufficiently distinct from the galls of European oaks. Round, prickly galls, of a reddish colour, and rather larger than a pea may often be seen on rose bushes. Each of them contains a single grub, and this in due time, turns to a gall-fly, which may be called *Cynips bicolor*, the two-coloured *Cynips*. Great numbers of *Cynips dichlocerus*, or the gall-fly with two-coloured antennæ are bred in the irregular woody galls, or long excrescences, of the stems of rose-bushes. The small roots of rose-bushes and of other plants of the same family, sometimes produce rounded, warty, and woody knobs, inhabited by numerous gall-insects, which, in coming out, pierce them with small holes on all sides. This species has been named *Cynips semipiceus*. The *Cynips bicolor* above-mentioned seems to be identical with *Rhadites Rosæ* that inhabits many parts of Europe, whence it may have been introduced into America.—*Francis Walker*.

Note on the capture of an Hermaphrodite specimen of Anthophora retusa.—On the 17th of April, 1845, as I was walking with a friend on the slopes of our downs, he caught a specimen of *Anthophora retusa*, which proved to be an hermaphrodite resembling the specimen caught by Mr. Smith, and figured 'The Zoologist,' (Zool. 890) the only difference being that the male part of my specimen is on the right side, and that of Mr. Smith's on the left, and perhaps the under side of my specimen shows more of the male, and the upper side less than Mr. Smith's.—*W. H. L. Walcott*; Clifton, March 5th, 1846.

On the use of moisture in collecting Coleoptera.—A few years ago I tried the following experiment with great success, the summer being a very hot and dry one. I carefully removed from the trunk of a decaying ash-tree, on which I had captured a speci-

men of *Platyrhinus latirostris*, a piece of its bark the size of my hand or rather larger, and after moistening it with water, I replaced it, and morning after morning, on lifting up the piece of bark I found assembled under it several specimens of that rather rare or at least local beetle, and on one morning I took as many as eleven specimens. This experiment was tried on a row of decaying ash-trees (now cut down) on Redland Green near Bristol. If you think the above worthy a place in 'The Zoologist,' I will thank you to insert it, as it may be useful to collectors.—*W. H. L. Walcott; Clifton, March 5th, 1846.*

Note on the variation, both in size and colour, of Insects found on the Coast.—The extraordinary changes which many insects are subject to when occurring near the sea, is a fact worthy of notice, and one which I do not remember to have seen recorded. The strictly maritime species must be left out of the question; for although many of them are extremely variable both in size and colour, still we have no means of ascertaining whether that variation is referable to the locality in which they are placed; for, being never found inland, nobody can have an opportunity of asserting that the same changes would not take place, were they to occur in positions far removed from the influence of the sea. When we find, however, the same insects in profusion both inland and on the coast, and observe also numerous and marked deviations from the typical forms peculiar to the latter situation; then, a priori, have we strong evidence that the changes in question are the result of local circumstances and not referable to chance. The alteration in size I have almost always observed to be from large to small, and scarcely ever the reverse; whereas in colour the change takes place very nearly as much from light to dark as it does from dark to light; nevertheless, the majority of instances I possess come under the latter department. It has been remarked that all the specimens of *Cossonus Tardii*, which I captured in Devonshire, were much smaller than the original series taken by Mr. Tardy at Powerscourt Waterfall, in the county of Wicklow; and so decided was the difference, that many of my friends, at first sight, concluded the two to be distinct species. This, however, I consider entirely owing to their locality, for my specimens were found only on the coast, and Mr. Tardy's at a considerable distance inland. And, inasmuch as neither of these instances rested on mere individual examples, but on long and conspicuous series, the certainty of the change from large to small was the more apparent. Mr. Holme of Oxford mentions having taken *Olisthopus rotundatus* in the Scilly Islands, in great profusion, in which none of the specimens exceeded two lines and a half in length. At Whitsand Bay in Cornwall I have captured *Gymnaëtron Campanulæ*, none of which exceeded three quarters of a line, the usual length being from a line to a line and three quarters. *Anthonomus ater*, the average length of which is two lines, I have taken a series of in Lundy Island, none of which exceeded one. In the same locality, also the common *Nedys contractus* scarcely ever reaches its natural size; and is moreover, so variable in colour, that I was long before I could persuade myself the species was not distinct. Instead of the blueish-black elytra, which I had always considered invariable, they all possess a yellowish or brassy tinge; and the legs, instead of being black, are in many instances, entirely of a light yellow, and in all, more or less, inclined to that colour. I have received from Mr. Hardy of Gateshead, specimens of *Haltica rufipes*, captured by him on the coast, in which (instead of the thorax being bright-red and the elytra bluish-green) the entire insect is of a uniform brownish-red hue. Of the rare *Mantura Chrysanthemii*, I have taken beautiful varieties at Mount Edgcumbe and in Lundy Island, many of which inclined to a rich metallic-yellow, instead of brassy-brown of the ordi-

nary specimens. Also in the latter locality particularly dark examples of *Telephorus testaceus*, which is the only instance of all which have been hitherto mentioned, in which the change has been from light to dark. In like manner I might enumerate other species equally remarkable, but I trust that those already mentioned are sufficient to verify my observations of the extreme liability to change, which, more or less, most insects possess when placed within the immediate influence of the sea. How to account for it I know not. I mention it as a mere fact, and leave it for others to assign a reason for its existence.—*T. Vernon Wollaston, B.A. ; Jesus College, Cambridge, March 9th, 1846.*

Note on the Coleoptera of South Wales. By T. VERNON
WOLLASTON, B.A., F.C.P.S.

I WAS much struck during a recent visit in South Wales at the totally different set of insects which were constantly occurring (mixed up of course with many species which are abundant everywhere) to those which I had been accustomed to observe in other districts. I think, therefore, a few remarks on them may not be devoid of interest. Although in Coleoptera, every department seemed to possess its rarities peculiar to the locality; still I cannot say that the *numbers* in any one given family bore anything like a steady ratio to the numbers in any other (taking the size of each department, respectively, into consideration); for *some* certainly preponderated to an incredible extent above the rest, and none perhaps so much so as the *Aphodii* and *Brachelytra*. In the genus *Aphodius* I was particularly fortunate, a very great number of species having come beneath my notice, and that too in an unfavorable season, and then my researches in many other departments comparatively failed. With the assistance of Mr. Dillwyn's 'Catalogue of the Coleoptera of Swansea (for a copy of which I am indebted to the author), a work most useful in pointing out the neighbouring localities; and having been fortunate enough to meet with several rarities unnoticed in his list; I succeeded in numbering upwards of forty species of the genus during a ramble of ten days along the southern coast.

Aphodius *Sus*, which is generally considered rare, occurs in the greatest profusion on the sea-shore near Swansea. On Sketty Burrows (where I found them crawling up the sand hills in company with *Ægialia globosa* and *Phylan gibbus*, I might have taken thousands; but on the coast of Pembrokeshire and Caermarthen I could not discover the smallest traces of them.

Aphodius fœtens is remarkably abundant throughout the whole district. They appear, when the sun is hot, to be more active on the wing than any other species of the genus, alternately flying for a short distance and then settling. At Tenby I observed this particularly, where I sat one day on a sand-hill to watch their evolutions, and where I might have captured hundreds without removing from the spot. They always returned to the place from whence they started and never wandered far; flying very rapidly, and, in many instances, whirling in a circle round their centre of attraction. In the same locality also *hæmorrhoidalis* occurs in profusion. Another species which is very common throughout the south of Wales, is *Aphodius nitidulus* (identical with '*Scarabæus ictericus*' of Paykull), an insect, which in other localities, is generally, I believe, looked upon as rare. Along the whole sandy district from Swansea to Tenby it may be literally said to abound, occurring, as Mr. Dillwyn rightly observes "particularly on the sea-shore." Inland it is considerably rarer; nevertheless it occurs occasionally. I took it during a flood in the Vale of Towey near Caermarthen, but very sparingly. I suspect it does not exist on the opposite coast of the British Channel, having never observed it in any part of the north of Devon in Cornwall, nor even in Lundy Island, where so many of the Welch insects are found. In company with it *rufescens*, *merdarius*, *ater*, and *marginatus* were particularly abundant.

In the Vale of Towey the only ones which occurred in any profusion were *obscurus*, *nigripes*, *merdarius*, and *erraticus*. The last I shall refer to is one which has always been looked upon as one of our rarest species, — viz. *plagiatus*, which, from a note in Mr. Stephens's 'Illustrations,' it appears "was first taken near Wisbeach in Cambridgeshire, and subsequently during a flood in the marshes at Peterborough by Mr. William Skrimshire." It was exactly under the same circumstances as in the latter case that I was fortunate enough to meet with it at Tenby. During a flood on the 9th of August I might have taken hundreds in the marshes to the west of the town towards Penally, where the small river flows into the sea; although even there, it was only in one particular spot that it was to be found. It is a circumstance worth noticing, that the form which is looked upon by the continental naturalists as the *variety*, is in England evidently the *typical* one,—for out of about sixty specimens which I captured, only *two* possessed the conspicuous red dashes on the elytra which are considered abroad as the *almost invariable* accompaniment. Amongst

many other insects which occurred profusely in this rich locality, I may mention the following as most worthy of notice.

Dromius foveolus	Ægialia globosa
Dyschirius cylindricus	Anomala Frishii
———— gibbus	Otiorhynchus atroapterus
Harpalus latus	Macrocnema marcida
———— piger	Cteniopus sulphurea
Hydroporus jugularis (Bab.)	Aleochara fuscipes
Colymbetes conspersus	———— bimaculata
Oethebius murinus	———— Cursor
———— pygmaeus	Philonthus lituratus
———— bicolor	———— bipustulatus
———— rufimarginatus	———— rubripennis
———— punctatus	Xantholinus bicolor
Chætarthria seminulum	Hesperophilus fracticornis.
Atomaria mesomelas	

To these I may add a pair of a very large and beautiful species of *Scymnus*,—if not undescribed, certainly new to this country:—several specimens of a new *Dendrophilus* (which I shall hope shortly to describe); and a series of a very distinct *Aphodius* which does not appear to be noticed by any of the British naturalists, and which has been subsequently taken by Mr. Hardy (I believe in tolerable abundance) near Newcastle.

Happening to be at Caermarthen during one of those heavy floods which are so common in all hilly districts, and nowhere more so than in the large tract of country stretching southwards to the sea below the Welch mountains, I had a good opportunity of witnessing in a short time the comparative distribution of the Coleopterous genera in the rich Vale of Towey,—the first fruits of which were washed up in the course of a few hours and left by tens of thousands—in living myriads,—amongst the refuse which remained after the waters had partially subsided. To describe indeed the vast confusion of life which existed in the rubbish when the flood commenced its retreat would be utterly impossible. It must be *seen* to be *conceived*. I have had numberless opportunities of witnessing the overflow of large rivers (particularly the Trent, on the borders of Lincolnshire and Nottinghamshire), and have often reaped immense harvests from their consequences; but never had I any conception of the *extreme limit* to which their devastations might be carried, until I beheld for the first

time *miles of uninterrupted life* running in parallel and almost confluent ridges along the whole length of the Vale of Towey. In viewing such a scene as this, an entomologist may be strictly said to be in one of "the golden moments of his life." The only questions which arise, are, *what to attack first*, and *how to go to work about it*, — two queries as important perhaps as they are practical. After revolving both in my mind, and finding myself in the very centre for action, necessity (who has ever been "the mother of invention") at once suggested a plan, the benefit of which I quickly reaped. Having only my sweeping-net with me, I commenced heaping in large handfulls, choosing those which appeared the most tantalizing, and employed myself in taking off the results to a common receptacle at the inn, to be examined carefully the following morning. All orders were pretty equally mixed, and even the Coleoptera (which was the most abundant) retained a pretty steady average in most of the families, except in the Brachelytra, which were by far the most numerous. In spite of the numbers being so great, there was nothing *particularly* rare amongst them; nevertheless, it may be interesting to give the names of a few, by way of showing what insects this district of South Wales produces which are not always to be met with in other localities. I select the following as most worthy of notice.

Dyschirius gibbus	Ephistemus gyrinoides
Stomis pumicatus	Mylæchus brunneus
Patrobis rufipes	Cercyon acutum
Bradytus ferrugineus	——— obsoletum
Blemus microps	——— picinum
——— discus	——— quisquilium
Epaphius secalis	Paramecosoma bicolor
Ocys melanocephalus	Typhæa fumata
——— tempestivus	Aphodius nitidulus
Periphus decorus	Oxyomus Sabuleti
——— atrocæruleus	Cryptohypnus 4-pustulatus
Tachypus Striatus	Cyphon pubescens
Gyrinus villosus	Haltica 4-guttata
Heterocerus flexuosus	——— vittata
Octhebius bicolor	Mantura Matthewsii
——— rufimarginatus	Scymnus analis
Limnebius truncatellus	Lathrobium elongatum
Chætarthria Seminulum	Tachyporus subtestaceus

Tachinus pullus
 Philonthus lituratus

Stenus bimaculatus
 Rugilus immunis

T. VERNON WOLLASTON.

Jesus College, Cambridge,
 January 9th, 1846.

Notes on Aphides with reference to the Plants on which they feed.

By FRANCIS WALKER, ESQ., F.L.S.

1. LAMIAM Linn. ARCHANGEL.

Species infested. L. album Linn. White archangel.

A SMALL species of *Aphis* infests this plant, and appears very early in the year, for I found the second generation already in existence at the end of February, 1846. This insect is white, oval, almost transparent, slightly convex, hairy like the plant on which it feeds; there is a pale buff tinge on the hind part of the abdomen: the antennæ are slender, setaceous, hairy, much longer than the body: the mouth is white, and reaches to the base of the middle legs: the eyes are dark brown: the tubes are very short, not more than one-twelfth of the length of the body: the legs are long, slender, and hairy. The young ones are like their mothers, but more linear. The *Aphides* while walking use their antennæ alternately to examine their way before them, and these organs are evidently the seat of the sense of feeling which is highly developed in the insect race, and probably supplies the deficiency of hearing and smelling, though some naturalists have pronounced the antennæ to be the organs of one, some of the other, of these faculties. Feeling, being the foundation of the other senses, which perhaps are only more highly developed modifications of it, is probably most strong when they are most weak, according to the rule, that the perfection of the lower faculties and of their corresponding organs is accompanied by an equal deficiency of the higher faculties, the general endowments of every creature being the same, though separately they are more various than are the species. When the eyes are very large, the antennæ are very slight, as in the *Libellulæ* and many of the *Diptera*. The antennæ that are used most in the air are generally knobbed, foliate, or branched as if to gather from all quarters, while those that are employed more often on the earth are usually setaceous or filiform; the former are comparatively quiescent, the latter very often vibrate rapidly. The antennæ of *Hydrophilus*, &c. are withdrawn, and the palpi are advanced in the water, but the reverse occurs when the insect comes to land and flies away. The *Aphides* that feed on bark have less of the peculiar characters of the tribe than those that live on leaves, but more than the species that feed on roots, and thus the three groups constitute a gradation, an epitome of that of the whole creation, which is thus illustrated by Coleridge. "Every rank of creatures, as it ascends in the scale of creation, leaves death behind it or under it. The metal at its height of being seems a mute prophecy of the coming vegetation, into a mimic semblance of which it crystalizes. The blossom flower, the acme of vegetable life, divides into correspondent organs with reciprocal functions, and by instinctive motions and approximations seems impatient of that fixure, by which it is differenced

in kind from the flower-shaped Psyche that flutters with free wing above it. And wonderfully in the insect realm doth the irritability, the proper seat of instinct, while yet the nascent sensibility is subordinate thereto; most wonderfully, I say, doth the muscular life in the insect, and the musculo-arterial in the bird, imitate and typically rehearse the adaptive understanding, yea, and the moral affections and charities of man. Let us carry ourselves back, in spirit, to the mysterious week, the teeming work-days of the Creator, as they rose in vision before the eye of the inspired historian 'of the generations of the heavens and earth, in the days that the Lord God made the earth and the heavens.' And who that had watched their ways with an understanding heart, could, as the vision evolving still advanced towards him, contemplate the filial and loyal bee; the home-building, wedded, and divorceless swallow; and above all, the manifoldly intelligent ant tribes, with their commonwealth and confederacies, their warriors and miners, the husband-folk, that fold in their tiny flocks on the honied leaf, and the virgin sisters with the holy instincts of maternal love, detached and in selfless purity; and not say to himself, Behold the shadow of approaching humanity, the sun rising from behind in the kindling morn of creation! Thus all lower natures find their highest good in semblances and seekings of what is higher and better. All things strive to ascend, and ascend in their striving. And shall man alone stoop? Shall his pursuits and desires, the reflections of his inward life, be like the reflected image of a tree on the edge of a pool—that grows downward, and seeks a mock heaven in the unstable element beneath it, in neighbourhood with the slim water-weeds and oozy bottom-grass that are yet better than itself and more noble, in as far as substances that appear as shadows are preferable to shadows mistaken for substances. No! it must be a higher good to make you happy. While you labour for anything below your proper humanity, you seek a happy life in the region of death. Well saith the moral poet:—

‘ Unless above himself he can
Erect himself, how mean a thing is man ! ’ ”

2. CHÆROPHYLLUM, Linn. CHERVIL.

Species infested. C. sylvestre, Linn. Wood Chervil.

This species was more than half grown at the end of February, 1846. It is shining, convex, pale greenish-yellow, increasing in breadth from the head till near the tip of the abdomen: the antennæ are slender, setaceous, hardly longer than the body; the tips of the joints from the second to the fourth and the whole of the following joints are fuscous: the mouth reaches to the base of the middle legs; its tip is fuscous: the eyes are dark brown: the abdomen has a row of impressions and a slight rim on each side; the tubes are about one-fifth of the length of the body; their tips are fuscous: the legs are long; the tarsi and the tips of the tibiæ are fuscous. The wingless generations of Aphides are mostly organized in order to obtain their permanent food from the plant whereon they are born; their life passes away in sucking, in making honey, and in bringing forth young ones.

“ Felix qui patriis ævum transegit in agris.

Ipsa domus puerum quem videt, ipsa senem.”

With them there is no interval of repose, no winter season when all the powers of life are dormant, no event whereon to raise the allegory of the death of Adonis or of Balder, no epoch when the faculties are recalled from their outward exercise to become

adapted to nobler employment. Condillac observed that, of all created beings, that one which has least intelligence is least adapted to deceive itself; an idea borrowed from Hobbes, who defines imagination as decaying sense. Part of the course of this world is a transition from instinct to reason, and it is the mutual conflict of these two principles that causes some errors from which perfect reason is as free as perfect instinct is. So extensive is the variety among created beings, that we cannot well understand the unity by which it is governed, nor the successive advances which it constitutes, and by which it is comprehended. This progress is, in part, a continual passage from the passive to the active state. The Aphides being comparatively rather passive than active, do not manifest those passions which in other animals would seem to have typified the succeeding existence and degradation of human nature. When a creature is entering into a higher state of existence, it loses those propensities and the functions of corresponding organs by which its former condition was characterized,—typical of man's ceasing from his earthly motives and employments when he departs to a more exalted life. Or, as it is expressed by Rathke, "When, through the retrograde metamorphosis, a part has shrunk up or even completely disappeared, another has normally formed itself, which compensates for it, or undertakes its function." The existence of Aphides for many successive generations represents the life of a single individual belonging to another tribe of insects. In the latter case every successor equals its original, but in the former instance it happens only occasionally that the offspring attains perfection, or ascends to a state equal to that whence it first emanated.

"Tel aux derniers canaux arrivé dans sa course,

Le sang revient au cœur et remonte à sa source."

In most insects every individual advances in organization to the limits of its sex and of its species, but in the Aphides a number of individuals are associated together successively or by descent as the means of progress. In creatures of still lower organization, such as sponges, a number of individuals are associated together contemporaneously, and form one compound structure; while in vegetables association prevails over individuality, which almost disappears. Man, in whom all the variations of animals are represented, condensed, or summed up, has the endowment of individuality or of independence in the gift of genius, which, if wisely used, tends to discover and to promote truth.

URTICA Linn. Nettle.

Species infested. U. dioica, Linn. Common nettle.

Aphis Urticæ, Linn. Syst. Nat. ii. 736. Faun. Suec. Fabr. Sp. Ins. ii. 387, 29. Ent. Syst. iv. 217, 35. Syst. Rhyn. 299, 35. Gmel. Syst. Nat. i. 2204. Scop. Ent. Carn. 139, 410. Rossi, Faun. Etrusc. 262, 1389. Schrank, Fauna Boica ii. 1, 106. Frisch. i. 8, 34. t. 17. Fonscol. Ann. Soc. Ent. x. 180, 21. Stew. ii. 110. Sam. i. 4.

Found beneath the leaves of the nettle at the end of February, 1846. It is then of a very pale green colour, almost white. The young ones are pale green; the antennæ and tarsi somewhat darker, semitransparent, so that the vessels within, of a bright green colour, are visible. The head is nearly white; the antennæ are setaceous, white, or very pale green, much longer than the body; the tips of the basal and the whole of the apical joints are pale fuscous: the mouth is pale green and extends to the base of the middle legs: the eyes are bright red, prominent: the segments on the back of the abdomen are distinct, transverse, nearly equal in size, but they are less distinct, and more

shining in the older than in the younger individuals: the tubes are pale green, and about one-fifth of the length of the body; their tips are pale fuscous: the legs are pale green, or sometimes white; their tarsi are pale fuscous: the abdomen has a rim on each side; the ventral segments are transverse, distinct, and nearly equal in size. The eyes of the young ones are deep brown. *Psylla Urticæ*, *Linn.*, occurs in abundance with this *Aphis* on the nettle in February. The honey-tubes, being moveable, are often twined in different directions, one pointing forward, the other backwards. The antennæ repose over the back when this insect is at rest, but when it begins to walk, they are brought in advance of its head, and moved up and down alternately. Among the purposes in the creative arrangements which are effected by some beings serving for the prey and food of others, are the support of the carnivorous species, the organization of matter into higher forms of life, and the control of the increase of the victims, whereby their existence, as species, is prolonged. The removal of this check by giving unlimited course to the multiplication of individuals would deprive them of the means of subsistence, and thereby endanger their continuance. This may have been a means whereby the extinction of groups was executed in former periods of time, when many kinds seem to have passed away without any other assignable instrument for their removal from the sphere of existence. Vegetation would soon be comparatively free from the attacks of Aphides, for these insects must perish from over-production, if their swarms were no longer destroyed by the changes of the weather, and also, but in a trifling degree, if they should cease to be the nourishment of *Coccinellæ*, *Hemerobii*, *Chrysopæ*, *Syrphi*, *Acari*, and of various aculeate and parasitic *Hymenoptera*. In the higher as well as in the lower orders of life, and in the history of mankind, the excess of every evil is accompanied by its remedy, and its cessation introduces a new and better epoch.

“ I thank thee, Heaven ! thou hast ordained it wisely,
 That still extremes bring their own cure. That point
 In misery, which makes the oppressed man
 Regardless of his own life, makes him too
 Lord of the oppressor’s. Knew I a hundred men
 Despairing, but not palsied by despair,
 This arm should shake the kingdoms of the world ;
 The deep foundations of iniquity
 Should sink away; earth groaning from beneath them ;
 The strong holds of the cruel men should fall,
 Their temples and their mountainous towers should fall ;
 ’Till desolation seemed a beautiful thing,
 And all that were and had the spirit of life,
 Sang a new song to her who had gone forth,
 Conquering and still to conquer ! ”

5. POA, *Linn.* MEADOW GRASS.

Species infested. *P. trivialis*, *Linn.* Common meadow grass.

Aphis radicum, Kirby and Spence, *Intr. Ent.* ii. 90.

This species, which belongs to the genus *Rhizobius* of Burmeister, is common at the roots of grass in January; it is surrounded by white cottony matter which exudes from

its body. The latter is oval, pale greenish yellow, very plump, and the sutures of the segments are indistinct : mouth fuscous, reaching to the base of the middle legs : antennæ fuscous, short, filiform, not one-fourth of the length of the body ; first and second joints of equal size ; third large ; fourth and fifth smaller ; sixth much longer than the fifth : no traces of tubes or tubercles on the abdomen : legs fuscous, short, slender, weak ; coxæ small, situated far apart from each other ; tibiæ as long as the thighs ; tarsi very short, 2-jointed. When young this species is narrower than when full grown, it then attains the length of one line.

FRANCIS WALKER.

The Apes at Gibraltar.—To matter-of-fact naturalists there is something very laughable in the pragmatistical blundering of the hyper-scientific and philosophical naturalists. The savans of this school in Paris have lately decided that there are no apes at Gibraltar : the isothermal lines, the temperature, the latitude, &c. preclude the possibility of such a circumstance, yet in spite of this, and in spite also of the knowledge that many in this country vastly prefer these absurd speculations to the multitudes of simple facts which 'The Zoologist' is publishing month after month, I venture to reprint the following passages from the recently published works of an Englishman and a Frenchman. The first is from Dr. E. F. Kelaart. "The *Chamærops humilis*, a palm very generally distributed over the Rock of Gibraltar, grows in great abundance on the south-eastern side ; its tender leaves and young shoots constitute the principal food of the apes which abound in this part of the Rock. The origin of this, the only quadrumanous animal in Europe, has been naturally the subject of many speculative opinions, and I regret to say that I cannot throw any new light on its history ; but I am disposed to side with the opinion, that these apes were introduced into Gibraltar by the Moors, during their early possession of the Rock ; for even in the present day similar apes are brought over from Barbary and sold in the market. Abyla, the hill on the opposite coast of Africa, is still called Ape's Hill, from the number of those animals seen there. The stationary habits of this animal on the Rock give additional interest to its history. There is no obvious reason why some of the apes should not have migrated to the neighbouring hills. The Queen of Spain's Chair, which is only three miles from Gibraltar, might afford them some diversity ; but no,—they seem to prefer looking on their fatherland from the heights of Gibraltar, and feeding upon the palms which grow there, rather than travel to the fruitful valleys of Andalusia. They are never likely to be exterminated from the Rock, no person being allowed to shoot, or in anywise hurt them, unless they venture near the town, which they seldom do. Some years ago, one used to come down on the declivities above the Alameda pretty regularly, during the time the guards trooped, and it consequently went by the name of the 'Town Major.' The curious history of another of these apes is given by an 'Old Inhabitant,' in his very interesting 'Guide to Gibraltar ;' who also very properly remarks, 'where they bury their dead it is impossible to say,' for no one has as yet found the carcass of any on the Rock. Some think the lowermost caves their mausoleum, whilst others go even further in their surmise, and suppose that they carry their dead into Africa, through a subterranean passage under the waters of the Mediterranean." The other passage to which I have referred is from Edmund Boissier, and is as follows. "A little above an old Moorish castle, whose solid masonry has resisted both time and weather, we entered the galleries,

and as we reached those that are above the landport-gate, I had the good fortune to meet with the apes, a rare occurrence, as they generally roam about the inaccessible acclivities on the eastern side of the Rock, and only leave those parts when the cold wind blows on that side. Of these apes I saw more than twenty; they remained on the rocks twenty feet above us, busy in the midst of the bushes searching for roots and fruits. As they are never hunted, they are not very wild, and the noise we made by clapping our hands scarcely made them run away. The denial from the Academy of Sciences of a fact so well attested as that of the presence of apes in Gibraltar, is almost as absurd as the assertion of a Spaniard, with whom I travelled from Seville to Madrid, that these animals occupied the Rock entirely, and were so numerous that no ship could dare approach land without running the risk of being sunk. As for knowing whether the apes have always existed there, or whether they have become naturalized, it must be difficult to determine; but I think the first supposition the most probable, since these animals are seen on the African mountains, and they might as well have also inhabited a country so near it, and with the same climate." I am not unaware that the citation of these passages will furnish some of our self-styled "philosophical" naturalists, with an additional argument against 'The Zoologist;' however, *sum cuique*, philosophy, hypothesis, speculation for them, fact, reason and truth for us.—*Edward Newman.*

Note on the Gibraltar or Barbary Ape.—This is the *Simia Pithecus*, Scheb. *Simia Inuus*, Linn. Syst. Nat. *Macacus Indicus*, Desm. Mamm. *Magot*, Buff. *Barbary Ape*, Pennant, Quadrupeds. Shaw's *Icones*. According to Shaw, it grows to the height of four feet. The one called the "Town Major" is said to have been nearly that height; they are generally, from two to three feet high. The fur is greenish-grey; face is of a swarthy flesh-colour; and instead of a tail there is a skinny appendage. The *Simia sylvanus*, or pigmy ape, appears to me a much smaller animal, and to have a rounder face. It is frequently brought over from Barbary, and sold in the Gibraltar market, but it has never been seen wild on the Rock; it is more easily tamed than the other, which is a very pugnacious creature. The other large quadrupeds found wild on the Rock are porcupines, foxes, and hares. The lizard tribe are in great abundance. The red-legged partridge is frequently met with: on the higher parts of the Rock the entomologist will find Gibraltar an excellent locality for making his researches. In fact the Fauna of Gibraltar, if ever produced, will be a sort of commentary, like its Flora, of the neighbouring parts of Spain and Africa.—*E. F. Kelaart, M.D.*

Carnivorous propensity of Hedgehogs.—Some years ago I had three or four hedgehogs which I kept in a garden, of which they had the range, in the same garden I also had several rabbits; after they had been together for some days, I found that a rabbit was killed every night, the remains of the skin and the bones only being left: this I supposed to be done by my neighbours' cats, and prepared to wage war on them accordingly, but to my surprise, on peeping into the garden early one morning, I saw a hedgehog busy at work with his nose buried in the fresh-cut throat of an expiring rabbit; and from further observations, I had no doubt that the hedgehogs had been guilty of all the murders. All the hedgehogs I have had, seemed to become "possessed" and died in that state; each one about three days before its death was seized with apparent insanity, and continued to run backwards and forwards in a semicircular path it had beaten in the grass before its house from morning till night, and probably in the night too; they appear to run as if for life, and evidently ran the life out of themselves, as

after about three days of it they became exhausted and died, though previously they had appeared to be in excellent health.—*R. Davis, Jun. ; Clonmel, March 3rd, 1846.*

Is the Black Rat strictly a native of Great Britain, or was it like its ally, the Brown Rat, introduced into Europe from Asia? And if so introduced, at what period? I shall be much obliged if you would be good enough to give me some information on these points. These are to me questions of considerable interest, in consequence of my having discovered in some Romano-British tumuli, which I opened in this neighbourhood, several skulls and other bones of rats, mice, and birds, which I believe to have been placed in the graves at the time of the interment of the bodies. From the elongation of the upper jaw, and the general shape and appearance of the skulls, I think they were decidedly not those of the *Arvicola amphibius*, but of a true rat. From the discoveries made in these barrows, there can be no doubt that they were part of a Romanized British burying ground, and that it was used afterwards by the Anglo-Saxons, was proved from the fact of my discovering in a grave, as a deposit, some Anglo-Saxon Sceattas. Now we know that at the commencement of the 8th century, sepulture within the walls of towns was introduced, and burial in tumuli abandoned, therefore, supposing the tenants of the graves in which the rats were deposited to have been Anglo-Saxons, and allowing that they were placed there, even at the latest period of sepulture in barrows, this will make them a thousand years old. I am aware that some antiquarians are of opinion that the bones of these animals which are found in barrows, were not placed there as deposits at the time of the interment of the bodies, but that at a much more recent period, they either inhabited the graves, or were carried there as the prey of some member of the stoat tribe. It strikes me, however, there is a strong objection to each of these theories. Granting that the first assertion might be true, in the case of the rats and mice, how are we to account for the bones of *birds* being in such situations, they could never have *inhabited* the graves! To this it may be replied, the birds were carried there by some polecat or weasel, which is certainly possible, but I hardly think probable, as all the bones, and particularly the skulls, which I found, were quite perfect, which surely would not have been the case, had they been the prey of animals of a class, whose peculiar characteristic in killing their victims, is springing at them and biting them on the head. Now had the animals in question been thus treated, their skulls would not have been in the perfect state they were found to be. The bones of dogs, horses, deer, and other animals are frequently found in barrows, and the fact of their being placed there as deposits is not doubted. Why then should we have one law for them, and another for "rats and mice and such small deer?" I found myself, in some of the Tumuli which I opened, the tusks of boars, the bones and teeth of dogs and horses, and the bones of some cloven-footed animal, none of which did I, for a moment, doubt had been placed there at the time of the interments. And I confess I see no good reason for suspecting that the bones of the rats, birds, and mice which were found in an adjoining grave, were not deposited there at the same period, especially as they were found placed on each side of the human skeleton, and sometimes extending through the entire length of the grave at intervals, with a much greater appearance of care and order than there would have been had they been dragged there by some beast of prey. The fact of the soil being a peculiarly dry chalk, will account for their preservation for so long a time. As the rat is known to have been an object of worship to some of the ancients, it might also have been held in veneration by the Pagan inhabitants of our island. In Guernsey limpets are frequently found as deposits in barrows. A spider enclosed in a metal box was sometimes placed

as a charm in the graves of females. One or two examples of this have been found in the burying ground which I have been speaking of; a drawing of one of which may be seen in Douglas's 'Nenia Britannica,' but I have never had the good fortune to find one myself.—*J. Pemberton Bartlett; February 26th, 1846.*

Effects of Music on Animals.—The fact that musical sounds have certain effects upon some animals, birds, insects, &c., has not escaped the notice of naturalists, and the following anecdote may not be uninteresting to some of your readers. I can vouch for its correctness, having been myself an eye-witness. Sitting round the fire one winter's evening at a friend's house, for our amusement a musical snuff-box was placed on the mantel-piece, when very soon, the tails of three or four mice were seen to protrude from between a crevice, occasioned by the shrinking of the wood of the mantel-piece from the brickwork; when the box ceased playing, it seemed a signal for the little strangers to depart, as their tails very soon disappeared. The experiment was repeated several times the same evening, and also subsequent ones, with similar success. It would seem, therefore, that the sensations experienced were those of pleasure, but whether one kind of music had a greater charm with them than another, I had no opportunity of judging.—*Charles Muskett; Norwich, January, 1846.*

Cattle moulthing Bones.—We arrived towards evening at the side of a range of hills called "Zuureberg." The name indicates the acid or sour quality of its pasturage, and was given by the farmers. It is a curious fact that the sourness of a pasture is always indicated by the cattle chewing bones, which they never do when the grasses are quite sweet: they know by instinct what remedy to take for neutralising the acidity in their stomachs. It was very interesting sometimes to see our oxen chasing each other to get hold of a bone out of the mouth of another. The farmers believe, from ignorance of the true state of things, that the cattle use these bones to sharpen their teeth, and generally affirm that the teeth of cattle become sensible and painful, from the sour nature of their food; while the fact is, they chew and swallow the bones, as a cure for the internal acidity.—*Zeyher's Tour in South Africa.*

Cattle moulthing Bones.—In reference to the several notes which have lately appeared in 'The Zoologist' on this subject, I may remark that in this quarter it is a quite common occurrence for cows to chew bones; as also old shoes, pieces of leather, and other articles they can pick up in the fields which may have been put upon the ground with the manure. I have myself often observed the circumstance. Instead of being beneficial, however, to the animals, as might be inferred from the statement of Pontoppidan quoted in the last numbers of 'The Zoologist' (Zool. 1246), it is here considered to be highly detrimental, and means are always resorted to to get the articles taken out of the mouth of the animal. One evident injury is, that growing cattle are prevented from eating, while chewing bones or other substances.—*George Lawson; 108, Hawkhill, Dundee, February 10th, 1846.*

Note of the arrival of some of the Summer Birds of passage at Shooter's Hill, Kent, in the spring of 1845.—

Chiffchaff.....	April 2	Black cap.....	April 23
Swallow	„ 6	Tree Pipit	„ 23
Willow Wren.....	„ 7	Whitethroat	„ 23
Nightingale	„ 13	Lesser Whitethroat.....	„ 23

Whinchat	April 23	Red-backed Shrike	May 11
House Martin	„ 29	Swift	„ 13
Turtle Dove.....	May 9	Garden Warbler	„ 14

The long, cold, miserable winter of 1844—5, throughout Europe intensely severe, led me to expect a late arrival of the summer birds of passage. The 18th of March, Blackheath was covered with snow, and it was bitterly cold. The 2nd of April I espied a little bird flitting about from tree to tree, and soon heard the peculiar note of the chiffchaff, the pioneer of the warblers. He had, however, but little to say, for he seemed to think with me, that chewing condensed Thames fog on the summit of Shooter's Hill at break of day was no treat. The afternoon of Sunday the 6th of April, I was surprised at observing two swallows comfortably hawking over the pond to the east of Eltham Park. I did not notice another swallow till the 12th, and they did not arrive in force before the 21st of April; our own swallows came the 2nd of May. Numbers of willow wrens arrived on Shooter's Hill the 7th of April. Early on Sunday morning the 13th of April, as I sat in the woods musing on the sins and sorrows of the city, compared with the innocent Arcadian revelling in the luxuries of the "incense-breathing morn," seven shillings a week, a wife and ten fine children, a nightingale darted close by me into a furze-thicket. There goes his red tail, and now he returns thanks for his safe arrival home, in what the bird-fanciers technically term "the sweet jug and water bubble." Later in the day a shepherd boy heard another nightingale on the opposite side of the woods. The cuckoo came the 21st. The moon was at full on the 22nd. I was greatly disappointed at not meeting with the blackcap from the 6th to the 9th of April. I beat up his usual quarters every morning, without finding him, till the 23rd of April, when, instead of exhibiting on the tops of the trees, the restless anxiety and excitement of a first arrival, anxiously looking out, and incessantly singing for a partner, he was composedly enjoying, in the depths of the underwood, the soothing society of his red-headed wife. I concluded the late opening of the buds had delayed his journey, and he had picked up his mate while travelling through France. I had a busy time of it the morning of the 23rd of April. Exactly on the same spot as last year I this morning discovered the two white-throats; several tree pipits had also arrived. I heard the plaintive note of the whinchat some time before I could find him. On the 27th of April the nightingale trappers were out in the woods in full force with their wives and children. I soon heard the call of a nightingale, saw him drop, down went the trap, rush like madmen went the trappers to find who had caught the poor victim, for which there were laid down no less than seven traps. Half-a-crown bought the bird. On discovering that his leg had been broken by the descent of the wire I gave him his liberty two miles from where he was taken. The following Saturday the 3rd of May, observing a pair of nightingales feeding in the grass skirting the woods, and that one had a very singular gait, I looked through the telescope, and immediately discovered my poor broken-legged nightingale limping about in rare good spirits; supporting himself with one wing he managed to hobble along the grass famously. I was overjoyed at again seeing him in his old quarters so happy under his affliction; and many and many a time, through the spring, have I leaned against a tree, and listened with delight to the glorious melody of my broken legged nightingale. I considered I had laid out my money well. The 29th of April I observed two house martins masticating mud for their Irish cabin. They appeared to have been here a day or two. Our martins arrived the 16th May. I saw a turtle-dove on the 9th of May. The 11th of May fell in with a male and female red-backed shrike. 13th of May saw a swift steering due north across the Dover

road. The 14th of May I heard the soft enchanting melody of the garden warbler. The 18th of May I noticed about a dozen male whinchats in the Eltham road, apparently resting on their journey northwards. Travelling from Ventnor to Culver-cliffs, Isle of Wight, on the 23rd of June, I observed numbers of swifts darting along the cliffs evidently on their passage, having crossed the channel, and made St. Catherine's that morning. While at Culver-cliffs, looking through a glass at the fleet of men-of-war at Spithead, manœuvring before her Majesty, I noticed, high in the air, hundreds of swifts crossing the Solent sea in large flocks. Was not this a very late arrival? — *Matthew Hutchinson; Blackheath.*

The Shrew and Grasshopper Warbler. In a note to Letter XVI. of White's *Selborne*, Mr. Rennie doubts the propriety of the term "whisper," as applied to the trilling notes of the grasshopper warbler. I have little doubt that White confounded the sounds made by the shrew with those of the grasshopper warbler. As this little animal is running along the bottom of a hedge, its low sibilous notes may not inaptly be called whispering. I am inclined to think that two shrews are in playful chace when I hear them, but as I seldom catch a glimpse, or more than a glimpse, I am not at all sure upon this point. The water-shrew makes similar sounds. I often hear a much more vigorous sibilous cry, which I used to suppose was made by a field-cricket, and many a time have I crept about on tip-toe in the hope of finding one sitting, all proper, at the entrance of its burrow; it is now some dozen years since I was undeceived by a countryman, who assured me it was "only a *sherrew* whistling on the muck-heap." Since this I have often heard similar notes from shrews in confinement, when they are fighting, or alarmed; if a worm is thrown to them they devour it with sibilous chattering. Led by White, I also had supposed that the hedge-bottom notes were the grasshopper warbler's, and I fancy I can remember being laughed at for saying so, as White was. Since I have met with the real grasshopper warbler in the Cambridge-shire fens, and elsewhere, I recognize its notes as perfectly distinct, nor has the bird ever continued them till I approached so near as White seems to have done to the author of the whisperings.—*John Wolley; Beeston, near Nottingham, March 19, 1846.*

Song of the Fieldfare. My attention was on Sunday, the 25th instant, directed to what I at first supposed to be the song of the blackbird, but observing something peculiar in it, I stopped to listen, and on a nearer approach was not a little surprised to find it proceeded from a fieldfare, which was so earnestly engaged in song as to allow me to approach so very near, I being partially concealed, that I could not be mistaken as to its identity. The song of this bird, which is very rarely heard in this country, partakes of the melodious whistle of the blackbird, combined with the powerful voice of the missel-thrush. This rare occurrence may be attributed to the unusual mildness of the season, which has called many of the feathered tribe into full song, as in spring.—*Edward Murch; Honiton, Devon, January 29, 1846.*

Swallows never seen at the Carron Iron-works in Winter. I observe in the February number of the 'Zoologist' (Zool. 1240) a paragraph entitled "Swallows at the Carron Iron-works in Winter." I can assure you that this is not the case. I have resided here for upwards of thirty years, and during that period I have never seen a swallow from about the end of September or beginning of October, until the end of April or beginning of May following. I may also remark that the temperature of Carron is much the same as that of the surrounding country; and in the time of frost the ice on the pond is as thick and strong as the ice on any other pond or loch within ten

miles of Carron. The oldest man in this quarter never saw a swallow at new year's day, and he is now eighty-five.—*John Dawson ; Carron Works, Feb. 5, 1846.*

[I am perfectly satisfied that the correspondent from whom I received the paragraph to which Mr. Dawson alludes sent it in all good faith, and in perfect confidence of its truth: I was myself well aware that it was simply one of the speculations of the "philosophical" school of Natural History, and relied on the better information of some of my "fact" correspondents to set it right.—*Edward Newman*].

Occurrence of the Great Black Woodpecker near Knaresborough. About ten days ago, near Ripley, on the estate of Sir Wm. A. Ingleby, Bart., a fine specimen of that very rare British bird, the great black woodpecker (*Picus Martius*) was shot, and is now in the possession of Mr. Jno. Stubbs, bird-stuffer, of Ripon. I understand it is a male bird.—*James C. Garth ; Knaresborough, March 13, 1846.*

Occurrence of the Bearded Titmouse (C. biarmicus) near the Land's End. About a week or ten days since a male specimen of this bird, in beautiful and perfect plumage, was observed and afterwards shot in a sedgy spot not far from the Land's End. The only other example of this species which has occurred, to my knowledge, in this county, is now in the collection of I. P. Major, Esq., Redruth, and that was formerly the property of the late Humphrey Grylls, Esq., of Boscan, near Helston, near which place it was obtained.—*Edwd. Hearle Rodd ; Penzance, February 6, 1846.*

Northern Range of the Nightingale, (Philomela Luscinia). It may be interesting to the readers of the 'Zoologist' to know that this delightful songster of our groves and thickets has occurred in this neighbourhood. My authority is that of a friend on whom I can place full reliance. He says that five or six years ago, about half-a-dozen specimens were shot or trapped in a thickety wood near this town, called Burton Bushes. There can be no doubt of the identity of the species, as the birds were heard singing when alive, and examined when dead, by persons well acquainted with them. I need hardly say that this wanton destruction of these elegant little strangers was deplored as a public loss by all the right-thinking inhabitants of the town, to whom the pleasant walks in Burton Bushes afford an agreeable promenade in the summer months. I am sorry to say, it has never, as far as I can learn, appeared here since.—*Beverley R. Morris ; Beverley, Yorkshire, Feb. 27, 1846.*

Effects of the Mild Weather. What wonderfully mild weather we have had for several weeks past! It is now more like the end of April than of February. The effects of this extreme mildness is very apparent both in the vegetable and animal kingdoms in this district. On the 22nd of January I heard a robin singing most delightfully, and on the 23rd I heard several more, and they have continued ever since. On the 18th of February I heard several skylarks pouring forth their melodious notes, as you expect to hear them in May or June. All the early spring flowers have been in full blow for some time past. I gathered the wood anemone a fortnight ago, together with primroses, wild strawberries, and *Ranunculus Ficaria*.—*Id.*

Anecdote of a Sparrow. An anecdote of a sparrow, somewhat similar to that of the robin mentioned in the January number of the 'Zoologist' by your correspondent Mr. Logan (Zool. 1211), was lately communicated to me by a friend, in whom I can place the utmost confidence. I took no note of it at the time; but I think the following is pretty correct. One evening, about 8 o'clock (I forget at what season of the year, but it was "quite dark"), a loud tapping was heard upon the panes of one of the windows of a room in which there was *no light*. The room was on the first floor of the building. There were but two persons, and both of these ladies, in the house at

the time, and they were afraid to enter the room to trace the cause of the annoyance. The window looked into the garden, which lay on the south side of the house; and serious apprehensions of a robbery being entertained, one of the ladies, after locking the door of the room, ventured to enter the garden from the ground floor; but on looking to the window nothing could be discerned, the tapping noise however continued. The gentleman himself having returned home about 9 o'clock, he procured a ladder, where-with he ascended to the window, in order to ascertain the cause of the disturbance, when he found it to be a common house sparrow, busily tapping with its beak at one of the low panes. He took the little bird in his hand, it offered no resistance, brought it down with him and put it into a cage, where it remained all night. On the following morning he took out the bird for the purpose of bringing it to me; but supposing it unable to fly, from the circumstance of its having allowed itself to be taken, he permitted it to leap out of his hand, which accomplished, it flew away, and has never since repeated its visit.—*Geo. Lawson*; 108, *Hawkhill, Dundee, February 10, 1846.*

A Quail shot in Worcestershire in January. On Wednesday, the 20th of January, 1846, Michael Grazebrook, Esq., whilst shooting at Pedmore, in the county of Worcester, rose a remarkably fine quail (*Coturnix vulgaris*), in a field of turnips, on a farm in the occupation of his brother, George Grazebrook, Esq. Mr. G. Grazebrook fortunately brought down his bird, which he has directed to be stuffed, and placed in his collection. The quail seldom visits this country earlier than May, and then only in small numbers, the males arriving first.—*John Evans*; *February 5, 1846.*

A Quail and Landrail shot in January, 1846. A friend of mine, the Rev. F. Durant, having several times recently met with a quail in the parish of Shiffnal, Salop, on the 20th of the present month of January, was fortunate enough to get a shot at and kill this beautiful little bird — never before, as I am aware of, found at so late a period of the year. In a neighbouring parish, in the same month, and but a few days before, another friend killed a landrail. Both birds were in excellent condition, and as fat as those found in the summer months. Had there set in a frost of any duration, in all probability both these birds would have fallen a sacrifice to its severity. May not the circumstance of their being found here at so very late a period not only be an indication of the mildness of the season to the present time, but that these migratory birds, which generally leave us in the autumn, had no anticipation of any severe weather arriving this year, or before the usual period of their visiting us in the spring had come round, and until which time there is no doubt they would have continued to remain, and probably have bred here, had they not been killed. Whether such anticipation that no severe frost will occur, prove correct, the next two months will decide. *W. H. S.*; *Hatton Hall, January 30, 1846.*

Note on the Water-rail. A short time ago, during the only two days of frost that have yet occurred here this winter, I shot one of the common water-rails, and saw several others. This bird is so frequently to be met with in the winter months, and so constantly found and killed during hard frosts, when it is driven to seek its food along the smaller streams, and at the bottom of sheltered ditches, where it is more easily made to rise, from the openness of the place and want of sufficient cover to conceal itself from its pursuers; that I am quite surprised that many of your correspondents should consider the appearance of this little bird in the winter months as at all a singular circumstance, or that they can have the slightest doubt as to its remaining here the whole year through. I have inquired of a great number of sportsmen, who all concur in attesting that to be the fact; and I have myself, for upwards of thirty years,

constantly met with the water-rail in the same places as the moorhen is generally met with, during every month in the year; and more especially in the hard frosts, when I have frequently seen four and five and more in a day, whilst beating for wild fowl, and when, for want of sufficient cover to conceal it, as in the summer months, the water-rail may be easily seen running along the bottom of ditches until forced to fly, and which, when once fairly on the wing, it will do at a pretty rapid rate; suddenly alighting and skulking along with great quickness to the nearest place of concealment, from whence it is difficult to make it rise a second time.—*Id.*

Occurrence of Sabine's Snipe in Hampshire. In looking over a collection of stuffed birds at a gamekeeper's near here, I found a specimen of Sabine's snipe (*Scolopax Sabini*), which he considered to be a black snipe, and merely a variety. I told him to keep the bird for me, but when I went again for it, it was gone. He said he shot it on Basing moor.—*P. L. Sclater; Hoddington House, Odiham.*

On the Rusty Tinge of the Plumage of Wild Swans. On looking at Mr. Yarrell's account of Bewick's swan (*Cygnus Bewickii*), there is one circumstance which a little puzzles me. He states concerning the plumage, that even in the second winter, the head and breast are strongly marked with rusty red. Now in the youngest bird of the three which I have recorded (Zool. 942) as having been preserved by myself last winter, the head and breast were snow white; this, therefore, must have been in at least its third winter, and yet, to quote my own words, "the loop of the trachea was not more than an inch and a half from the anterior edge of the sternum." Surely this would indicate that the bird in question was not so old as two years and a half. If not, what must have been the age of the oldest of these specimens, in which the trachea was so much more developed? I have seen the common swan, at all ages, with its head and neck deeply tinged with exactly this colour, rusty red, from feeding among weeds. Can this be the explanation of the colouring of Mr. Yarrell's specimens? And may not this swan attain its perfect plumage in the second year? I cannot think that my bird can have been older.—*H. T. Frere; Aylsham, March 3, 1846.*

An account of the Birds found in Norfolk, with Notices of some of the rarer Species which have occurred in the adjoining Counties.

By JOHN H. GURNEY, Esq., and WILLIAM R. FISHER, Esq.

White-tailed Eagle, *Haliaeetus albicilla*. The adult bird of this species is said to have been taken in Norfolk, but we believe without sufficient authority, and certainly no instance of its occurrence has come to our knowledge. The immature birds are, however, by no means uncommon, one or two being generally procured in the course of every autumn or winter, from which it may be inferred that a portion of the young birds which are hatched in more northern countries, find their way to our coasts when driven by their parents from the places where they were reared; it being a well-known fact, that the

old eagles will not suffer their young to remain near them after they have become able to provide for themselves : and we may here remark, that it is probably for the same reason, that so large a proportion of the different birds of prey which occur on our coasts in the autumn, are immature specimens.

This is the only species of eagle which belongs to Norfolk ; for although the golden eagle has been more than once mentioned by ornithologists as having been taken in the county, we have been unable to obtain satisfactory evidence of its occurrence, and are disposed to believe that specimens of *H. albicilla* in various stages of plumage have been mistaken for golden eagles.

It has been observed that white-tailed eagles, when they appear on the coast, are constantly followed and mobbed by flocks of gulls, and that when they come inland they are similarly accompanied and persecuted by rooks.

A young male bird of this species was some years since procured off Winterton in the following manner. Some boys having thrown out a line and hook into the sea, baited with a herring, for the purpose of catching a gull, the bait was spied and pounced upon by the eagle ; and the hook becoming fixed in the inside of his foot, he was found by the boys upon their return to examine their line, floating on the surface of the water. They immediately went off in a boat and completed their capture without much difficulty. This bird was subsequently kept in confinement for some years, but accidentally escaping, was shot a few days afterwards by a gamekeeper in the neighbourhood.

Osprey, *Pandion haliaetus*. A few specimens occur nearly every year, most frequently in autumn, but occasionally in the spring and winter months. The habit of the osprey is to fix upon some large piece of water, and if not disturbed, to confine its fishing almost exclusively to that particular locality, so long as the supply to be obtained from it continues to be tolerably abundant. By far the greater number of those which are taken in this county are in immature plumage.

The species next in order, the Gyr Falcon, *Falco gyrfalco*, has been included by some in the list of Norfolk birds, but we think too hastily, as the only specimen known to have been procured in the county, showed evident marks of having escaped from a falconer.

Peregrine Falcon, *Falco peregrinus*. Of not unfrequent occurrence, especially during the autumn. A pair of these birds formerly bred in the cliffs on the sea-coast at Hunstanton, but we believe have now ceased to do so ; and we learn from the Rev. Richard Lubbock's

recent publication,* that some years since a pair were in the habit of nesting in the steeple of the church at Corton, near Yarmouth.

Another pair not long ago frequented the cathedral at Norwich apparently for the same purpose, but the female being shot while in the act of chasing a tame pigeon in the heart of the city, their intention was frustrated. The following account is given by the late Mr. Hunt of Norwich, in his work on British Ornithology, of a peregrine falcon which had previously frequented the same locality. "A bird of this species was observed to take up its residence in the spire of Norwich cathedral; it arrived at the cathedral about the middle of September, and left it about the first week in March, and continued to do so for eight successive years. It was generally to be seen near the top of the spire, and invariably on that side which by sailors is called the leeward, from whence it used to fly at pigeons and other birds which were so unfortunate as to approach its station." A young male peregrine falcon was killed in the autumn of 1843, by dashing during the night against one of the lighthouses on our eastern coast. The legs of this specimen were observed to be of a yellowish white colour, while in a female, apparently of the same age and in similar plumage, which occurred about the same time, the colour of the legs was a greenish blue, (Zool. 442).

Hobby, *Falco subbuteo*. The hobby occurs in Norfolk as a summer visitant, but the specimens obtained are far from numerous and are generally in immature plumage.

It occasionally breeds in the county, and an instance of its doing so occurred at Brixley near Norwich in the spring of 1844. An immature specimen of the hobby was shot some years since whilst sitting on a church tower in the centre of the city of Norwich. The occurrence of this species at Yarmouth so early as the month of February, is noticed at page 248 of the 'Zoologist.'

Red-footed Falcon, *Falco rufipes*. About six examples of this bird are known to have occurred in the county of Norfolk. The last, an adult male, was procured in August, 1843, and is recorded in the 'Zoologist,' page 350.

Merlin, *Falco aesalon*. Occurs in Norfolk in September and throughout the autumn and winter months, at which times of the year the young are not unfrequently met with; but the old birds are decidedly rare.

* 'Observations on the Fauna of Norfolk, and more particularly on the Districts of the Broads.'

Kestrel, *Falco tinnunculus*. Common throughout the year, and breeds in the county. We have seen a kestrel, taken from the nest in the spring of 1844, which is entirely destitute of the pigment of the choroid coat at the back of one eye. The eye is blind and perfectly transparent, in that respect differing from the eye of an albino, in which the pigment being present, though colourless, is available for sight. In the specimen alluded to, the other eye is perfect.

Goshawk, *Astur palumbarius*. The goshawk is an occasional visitor in Norfolk, one or two examples being generally obtained every year. These chiefly occur in early spring and autumn, and are for the most part in immature plumage.

Sparrow-hawk, *Accipiter nisus*. The sparrow-hawk is common and breeds in Norfolk, but is a rather less numerous species than the kestrel.

Kite, *Milvus vulgaris*. The kite is a rare bird in Norfolk, and very irregular in its visits. It has, however, been occasionally known to breed with us, and we believe that it regularly does so in the neighbouring county of Huntingdon.

Common Buzzard, *Buteo vulgaris*. A regular autumnal migrant to this district, but not in large numbers. It is probable that a few pair breed in the county, but no instance of their doing so has come under our observation.

A Buzzard which was lately taken near Cromer, was so closely pursued by two young sparrow-hawks, that the latter were both killed by a discharge from the second barrel of the same gun with which the buzzard had just previously been shot.

Rough-legged Buzzard, *Buteo lagopus*. The immature birds of this species visit us in autumn, but vary exceedingly in their numbers; being very plentiful in some years, and in others so scarce as to be hardly obtainable. The adult bird has occurred, but is always extremely rare.

The rough-legged buzzard is destructive to partridges, and also to rabbits, and we know an instance of a stoat having been found in the stomach of one which was shot near Lynn.

The last instance of the occurrence of this bird on the eastern coast in large numbers, was in the winter of 1839-40; at which period they were so numerous that during the three months of November, December, and January, no less than forty-seven specimens were ascertained to have been taken within eight miles of the town of Thetford, besides many others which were procured elsewhere.

Honey Buzzard, *Pernis apivorus*. Occasionally appears in Norfolk

towards the end of summer or rather later; a considerable number were obtained in the autumn of 1841 in almost all the different stages of plumage, from the birds of the year to those which had acquired the full adult plumage.

The last example of which we are aware occurred in September, 1844, and is noticed at page 793 of the 'Zoologist.'

Marsh Harrier, *Circus æruginosus*. Breeds in most of the marshy districts of the county, where it was formerly very common, but has now become much less so. It remains in Norfolk through the year,

Hen Harrier, *Circus cyaneus*. The hen harrier is also found in Norfolk throughout the year, and nests in the more marshy districts, but is not a numerous species.

Montagu's Harrier, *Circus Montagui*. A few pair breed in some of the fens in the south-western part of Norfolk, and remain in the county throughout the year,

An example was killed at Brundall on the 10th of June, 1845, and four others were observed near the spot at the same time, and for several days afterwards.

Scops Eared Owl, *Scops Aldrovandi*. There are two well-authenticated instances of the occurrence of this bird near the town of Yarmouth, and we know of two specimens which are said to have been killed near Norwich.

Long-eared Owl, *Otus vulgaris*. This owl is a regular and rather numerous autumnal visitant. Some few remain throughout the year, chiefly frequenting the vicinity of our northern coast, and nesting in those parts of the fir-plantations in which the trees are young and thick.

Short-eared Owl, *Otus brachyotus*. The short-eared owl is also a regular and numerous autumnal visitant, arriving on our coast about the third week in September. A few pair stay through the year and breed in the fenny parts of the south-west of Norfolk. Their eggs have also been occasionally taken in the neighbourhood of the coast.

Barn Owl, *Strix flammea*. Common throughout the year and breeds with us. We know an instance of a pair of these birds having nested and brought up their young, three in number, in a state of confinement.

Tawny Owl, *Syrnium stridula*. Common throughout the year, and breeds in the county. We have known this owl to nest in a deserted rabbit or fox's hole on the side of a wooded hill near the coast. The nest was about two feet from the mouth of the hole.

Snowy Owl, *Surnia nyctea*. Two instances are on record of the

capture of the snowy owl in this county, the one at Felbrigg in April, 1814, and the other at Gunton near Cromer in January, 1820.

Little Owl, *Noctua passerina*. It is stated by Mr. Hunt, in his 'British Ornithology,' already quoted, that a pair of little owls had a nest several years since at "no great distance" from the city of Norwich, and two instances are mentioned by the Messrs. Paget,* of the capture of this species in the neighbourhood of the town of Yarmouth.

Tengmalm's Owl, *Noctua Tengmalmi*. One of these owls was taken some years since at Bradwell, in the north-eastern part of the county of Suffolk.

Great Grey Shrike, *Lanius excubitor*. Although by no means a common bird in Norfolk, the grey shrike is found occasionally at all times of the year, but especially towards the end of autumn, and in winter. We are not aware that it has been known to breed in the county, but are informed that a very young specimen was procured near Diss some years ago, early in the month of July. We know an instance in which a bird of this species was caught by a bird-catcher, on one of whose call-birds it had pounced, after the manner of the smaller hawks.

Red-backed Shrike, *Lanius collurio*. A not uncommon spring and summer visitant, arriving in April, and departing in September. It habitually breeds in Norfolk, but is a much less numerous species than in many of the more southern counties. A brood of young red-backed shrikes having been taken from the nest, and placed in a cage hanging near the spot, were regularly fed by the old birds. Among the remains of the food which was brought to the cage, we noticed the skulls of small birds and parts of some large insects, apparently humble bees.

Woodchat Shrike, *Lanius rutilus*. Two specimens of the woodchat are recorded to have been taken in this district, the one at Swaffham, and the other at Bradwell, near Yarmouth.

Spotted Flycatcher, *Muscicapa grisola*. A common summer visiter, and breeds with us.

Pied Flycatcher, *Muscicapa atricapilla*. This bird, though rather rare, occurs in Norfolk in the course of its migration passing northward in spring and southward in autumn; and we have good reason to believe that it occasionally nests in the vicinity of the coast.

* 'Sketch of the Natural History of Yarmouth and its Neighbourhood,' by C. J. and James Paget.

Common Dipper, *Cinclus aquaticus*. As far as we are aware the dipper only occurs in Norfolk as a rare and irregular straggler.

Missel Thrush, *Turdus viscivorus*. Common throughout the year, and breeds in Norfolk.

Fieldfare, *Turdus pilaris*. A common winter visitant, arriving in November, and leaving us late in April.

Song Thrush, *Turdus musicus*. Common throughout the year and breeds with us. In very severe winters, many of the song thrushes appear to leave this district and to go further south.

Redwing, *Turdus iliacus*. A common winter visiter, arriving in Norfolk somewhat later than the fieldfare, and departing rather earlier.

Blackbird, *Turdus merula*. Common throughout the year, and breeds with us.

Ring Ousel, *Turdus torquatus*. This bird occurs in its migration, going northward in spring and southward in autumn; and it has also been known in one or two instances to nest in this district.

Golden Oriole, *Oriolus galbula*. This rare bird has been several times procured in the counties of Norfolk and Suffolk; and two instances are on record of its nesting in this district.

Alpine Accentor, *Accentor alpinus*. We believe that the alpine accentor has not been taken in the county of Norfolk, but the Rev. R. Lubbock observed one in the year 1824, about the month of March, at Oulton in Suffolk: and we may also mention the well-known capture of Dr. Thackeray's specimen at Cambridge, as an instance of its occurrence in this part of the island.

Hedge Accentor, *Accentor modularis*, Redbreast, *Erythaca rubecula*. Common throughout the year, and breed in the county.

Blue-throated Warbler, *Phenicura Suecica*. A male bird of this species was found dead on the beach at Yarmouth on the 21st of September, 1841, which is the only instance that has come to our knowledge of its occurrence in Norfolk.

Common Redstart, *Phenicura ruticilla*. A common summer visiter arriving in April about the same time as the two next succeeding species. It breeds in Norfolk.

Stonechat, *Saxicola rubicola*. Common in summer, and breeds with us. Some of these birds appear to remain in Norfolk through the winter.

Whinchat, *Saxicola rubetra*. The whinchat is common in summer, and breeds in the county. It is, however, less numerous than the stonechat. We know an instance of its having been observed in winter.

Wheatear, *Saxicola œnanthe*. Common in summer in the open parts of the county, and breeds with us. It arrives about the third week in March, and departs in September. In Sir Thomas Brown's 'Account of Birds found in Norfolk,' written at Norwich in the reign of Charles the Second, it is mentioned that the wheatear was "taken with an hobby and a net."

Grasshopper Warbler, *Salicaria locustella*. Breeds in Norfolk, arriving in April and departing in September, but is not common.

Sedge Warbler, *Salicaria phragmitis*. Common in summer, and breeds with us. Its times of migration nearly correspond with those of the last species.

Savi's Warbler, *Salicaria luscinioides*. A bird of this species was killed many years ago in the marshes near Norwich, by the Rev. James Brown, and is mentioned by Messrs. Sheppard and Whitear,* under the head of the reed warbler, as a variety of that bird. Mr. Brown informs us, that this specimen was sitting on the upper part of a reed, uttering its note, which was not unlike that of the grasshopper warbler, and also somewhat resembled the noise made by a spinning-wheel. It appeared to be very shy, and when disturbed ceased to sing and dropped down among the thick herbage, but soon re-ascended to its former station and recommenced its notes.



Nest of Savi's Warbler.

Mr. Brown adds that this is the only living example that he has succeeded in observing, although he has frequently heard a note which he believes to have been that of this warbler.

* 'A Catalogue of the Norfolk and Suffolk Birds; with Remarks.' By the Rev. R. Sheppard and the Rev. W. Whitear. Published in the 'Transactions of the Linnean Society,' 1825.

Since the occurrence of the above-mentioned specimen, a pair of these birds have been procured at South Walsham. They were killed in the summer of 1843.

The drawing above engraved, is, we believe, the first representation which has appeared of the nest of Savi's warbler. It was taken from one of the three nests mentioned at page 1212 of the 'Zoologist,' on the authority of Mr. Bond, to have been taken at Backsbite in the parish of Milton, near Cambridge. "These nests in each instance were on the ground. They are cup-shaped, compactly formed of the long narrow leaves of the common reed (*Arundo phragmitis*) wound round and interlaced, but without any other lining."

One of the eggs strongly resembles the egg of the grasshopper warbler, being of a whitish-pink, covered with minute specks of pale red and light ash-grey.

We are much indebted to Mr. Bond for the opportunity which he has thus kindly afforded us, of figuring, from a specimen taken in this district, the nest of one of the rarest of the British *Sylviadæ*.

Reed Warbler, *Salicaria arundinacea*. A regular summer visiter, and breeds with us. It is not uncommon, but is more local in its habits than the sedge warbler. It also breeds later than that bird, which lays its eggs early in May, whereas the nest of the reed warbler is frequently still empty in the beginning of June.

Nightingale, *Philomela lusciniæ*. The nightingale is a regular summer visiter, and breeds with us. Its numbers vary considerably in different localities, but on the whole it appears to be somewhat less numerous in Norfolk than in the more southern counties. It arrives, like the last species, in the month of April, and departs in September.

Blackcap, *Curruca atricapilla*. Common in summer, arriving about the end of March, and departing in September. It breeds in Norfolk.

Garden Warbler, *Curruca hortensis*. A summer visiter, and breeds in the county, but is not very numerous.

Common Whitethroat, *Curruca cinerea*. Common in summer, and breeds in the county.

Lesser Whitethroat, *Curruca sylvicola*. Not numerous, but appears in summer, and breeds in the county.

Wood Warbler, *Sylvia sylvicola*. Common in summer, and nests with us, but appears to be chiefly confined to localities which abound in high trees. It appears like the three preceding species in April, and leaves in September.

Willow Warbler, *Sylvia trochilus*. Common in summer, and breeds in Norfolk, arriving late in March, and departing in September.

Chiff Chaff, *Sylvia hippolais*. Not uncommon in Norfolk from March to October, but is more local than the preceding species. A low bush, frequently of furze, appears to be a favourite locality for the nest of the chiff chaff. In such a situation we have taken as many as four nests within the distance of a few yards.

Dartford Warbler, *Melizophilus Dartfordiensis*. With the exception of a single specimen, killed on the Denes, near Yarmouth, we know of no instance of the occurrence of the Dartford warbler in Norfolk.

Golden-crested Regulus, *Regulus cristatus*. Common throughout the year, and breeds with us. In the months of October and November the numbers of this species are greatly increased by migratory arrivals on the coast. Upon the completion of their journey, they are often so much exhausted as to suffer themselves to be taken by the hand. It is probable that many of these birds leave us in winter, and perform an inland migration to the southward, especially in severe seasons.

Fire-crested Regulus, *Regulus ignicapillus*. Mr. Yarrell mentions that a specimen was caught off the coast of Norfolk in October, 1836, and the occurrence of an example at Yarmouth in November, 1843, is recorded in the 'Zoologist,' (Zool. 451).

Great Tit, *Parus major*, Blue Tit, *Parus cæruleus*. Very common throughout the year, and breed with us.

Cole Tit, *Parus ater*. Common throughout the year, and breeds with us, but is more local than the two preceding species.

Marsh Tit, *Parus palustris*, Long-tailed Tit, *Parus caudatus*. Not uncommon throughout the year, and breed with us.

Bearded Tit, *Calamophilus biarmicus*. Not uncommon in the neighbourhood of the broads and some other marshy districts, where it breeds, and continues through the year.

Bohemian Waxwing, *Bombycilla garrula*. Appears as a winter visiter, and is, generally speaking, rare, but has occasionally occurred in considerable numbers. In two examples of this species which have come under our notice, the tips of the tail-feathers have been furnished with wax-like appendages similar to those which ornament the wings. One of these birds was certainly a male, and we think it probable that the distinction above-mentioned may be a mark of that sex in its adult state.

Pied Wagtail, *Motacilla Yarellii*. Common throughout the year, and breeds with us.

Grey Wagtail, *Motacilla boarula*. The grey wagtail is not uncommon in Norfolk in the early part of the spring, on its way towards its breeding-places in the more northern counties, and it also occurs during its southward migration in autumn.

Grey-headed Wagtail, *Motacilla neglecta*. A male bird was killed at Sherringham about May, 1842; another wagtail was procured at the same time, which was probably the female; but as the person who shot them only preserved the brighter coloured specimen, the latter was unfortunately not identified. A nest, containing four eggs, was taken on the heath at Herringfleet in Suffolk, on the 16th of June, 1842, which probably belonged to a bird of this species. The eggs closely resembled an egg of the grey-headed wagtail which had been taken on the continent, and the situation of the nest, and the materials of which it was composed, also corresponded with the descriptions given of the nest of this bird.

Ray's Wagtail, *Motacilla flava*. Common from March to September, and breeds in Norfolk.

Tree Pipit, *Anthus arboreus*. A rather common summer visitant, arriving late in April, and breeds in the county.

Meadow Pipit, *Anthus pratensis*. Common, and gregarious in winter, and breeds in Norfolk. Its numbers are considerably increased by migratory arrivals in the months of October and November.

Rock Pipit, *Anthus petrosus*. The rock pipit migrates to our coast in autumn, generally in the month of November, but not in large numbers.

Richard's Pipit, *Anthus Ricardi*. Three Norfolk specimens of this bird have come under our notice, all of which were procured in the neighbourhood of Yarmouth. Two of these occurred in the month of April, and the third in the month of November.

Shore Lark, *Alauda alpestris*. An immature male was killed on the beach at Sherringham, in March, 1830.

Sky-lark, *Alauda arvensis*. The skylark is common in Norfolk throughout the year, and breeds with us; large migratory flocks also visit us in the months of October and November on their way southwards, and in early spring on their return towards the north.

Woodlark, *Alauda arborea*. The woodlark is not a common bird in Norfolk. It is, however, found in some parts of the county, and we believe breeds with us, and remains throughout the year.

Snow Bunting, *Plectrophanes nivalis*. Common in winter in the

neighbourhood of the coast, especially in severe seasons. It arrives about the third week of October, and departs early in April. The snow bunting has, in more than one instance, been known to nest in confinement.

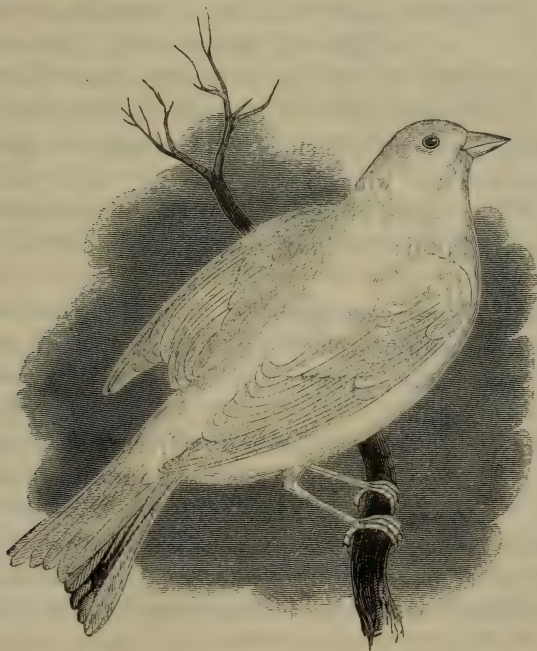
Common Bunting, *Emberiza miliaria*. The common bunting is found in Norfolk throughout the year, and breeds with us, but is not a very plentiful species. It is probable that its numbers receive an accession in the autumn, by migratory arrivals on the coast.

Black-headed Bunting, *Emberiza schæniclus*. Common throughout the year, and breeds with us; but is principally confined to marshy districts.

Yellow Bunting, *Emberiza citrinella*. Very common throughout the year, and breeds in Norfolk.

Ortolan Bunting, *Emberiza hortulana*. We have seen a specimen of this bird, which was said to have been killed near Norwich.

Chaffinch, *Fringilla cœlebs*. Very common throughout the year, and breeds with us.



White variety of the Brambling.

Mountain Finch, *Fringilla montifringilla*. The brambling or mountain finch is a regular winter visiter to this county, often occur-

ring in considerable numbers, especially in severe seasons. The following instance of this bird's nesting in confinement, has been kindly communicated to us by a gentleman residing near Norwich. A pair of bramblings built a nest in an aviary in the last week of the month of June, 1842, and two eggs were laid, both of which were removed and found to be good. In June, 1843, the same birds again nested, and the female laid two eggs, and these having been removed, they formed a second nest in a different spot, in which four eggs were deposited. The last nest, together with the eggs, were accidentally destroyed, and it was not ascertained whether the eggs laid during the year were good or not.

In the last week of June, 1844, the same pair of birds again made a nest, in which the female laid two eggs, which were also removed, and found to be good. We may add that Mr. Hewitson's work on 'British Oology,' contains an account of this bird's nesting in an aviary at Beccles, with a good figure of the egg.

A very beautiful variety, figured in the preceding page, was shot from a flock at Melton, near Norwich, in December, 1844. With the exception of a brown patch on one or two feathers of one side of the tail, this specimen was entirely white, the greater part of its plumage being also pervaded with an elegant tint of yellow, which particularly showed itself on the sides of the head, and on the edges of the quill-feathers of the wings and tail, as well as on the feathers under the wing. The colour of these latter, which is usually yellow, was remarkably bright in this specimen, and extended over a greater space than usual.

Tree Sparrow, *Passer montanus*. A few of these birds are found in Norfolk, and breed with us, remaining throughout the year. They are very local in their habits, except in winter, when they sometimes disperse in search of food.

House Sparrow, *Passer domesticus*, Greenfinch, *Coccothraustes chloris*. Very common throughout the year, and breed in Norfolk.

Hawfinch, *Coccothraustes vulgaris*. The hawfinch is a rare bird in Norfolk, and we believe only occurs as an irregular migrant. A specimen was taken alive some years since in a pigeon-house at Taverham in this county, a singular circumstance in a bird of such wild habits.

Goldfinch, *Carduelis elegans*. Not uncommon throughout the year, and breeds in Norfolk. Its numbers are somewhat increased in autumn by migratory arrivals on the coast. A notion exists among bird-catchers in this county, for the correctness of which we cannot

vouch, that both this species and the bullfinch are polygamous, to the extent of three or four females to one male.

Siskin, *Carduelis spinus*. The siskin appears in Norfolk in considerable numbers on its way to the southward towards the end of autumn, and it also occurs on its return to the north about the end of January.

At page 1075 of the 'Zoologist,' is a notice by Mr. John Smith of Yarmouth, to whom we are indebted for much valuable information relative to the birds of Norfolk, of the nesting of this species in confinement.

Common Linnet, *Linota cannabina*. Common throughout the year, breeds with us.

Mealy Redpole, *Linota canescens*. An occasional winter visitant, especially in severe seasons.

Lesser Redpole, *Linota linaria*. This is a regular and numerous winter visitant in Norfolk, and a few pair generally remain and breed in the county.

Twite, *Linota montium*. An occasional migratory visitant, passing northward in spring, and southward in autumn.

Bullfinch, *Pyrrhula vulgaris*. Is found in Norfolk throughout the year, and breeds with us. Its numbers vary considerably, but generally speaking, it is not a numerous species, except in a few particular localities.

Pine Grosbeak, *Pyrrhula enucleator*. The pine grosbeak has only occurred in Norfolk as a very rare and occasional visitant. A flight of these birds was observed on Yarmouth Denes in November, 1822, and two instances are on record of their having attempted to breed in this district. In one of these cases, the nest containing four eggs was taken near Bungay; and is said to have been found on a low branch of a fir, near the stem of the tree, and about three feet from the ground. In the other instance, which occurred at Raveningham, the old birds were shot while in the act of building.

Common Crossbill, *Loxia curvirostra*. This bird is an occasional migrant to Norfolk, generally appearing in winter, and sometimes in rather considerable numbers. It often continues with us during the earlier part of the spring, and there is reason to think, that when this is the case, a few remain in this district for the purpose of nesting, two instances of which are recorded in Messrs. Sheppard and Whitear's 'Catalogue of Norfolk and Suffolk Birds.'

White-winged Crossbill, *Loxia leucoptera*. We believe that this species has not been observed in Norfolk, but a specimen was killed in

Suffolk, some years since, out of a flock of about five or six which appeared in the neighbourhood of Ipswich.

Red-winged Starling, *Agelaius phœniceus*. A male specimen of this bird, in the plumage of the second year, was shot near Barton Broad, about the 1st of June, 1843.

Its stomach contained the remains of coleopterous insects, and its plumage had all the appearance of that of a wild bird. As, however, this species is occasionally kept as a cage bird, it is of course quite possible that the bird in question had escaped from confinement. Its occurrence is recorded in the 'Zoologist,' (Zool. 317).

We take this opportunity of correcting a slight inaccuracy in the new edition of Mr. Yarrell's work on 'British Birds,' in which it is stated, in a quotation from Mr. Lubbock, that the orange-winged starling above-mentioned, was shot near Rollesby Broad.

Common Starling, *Sturnus vulgaris*. Very common throughout the year, and breeds with us.

Rose-coloured Pastor, *Pastor roseus*. Several instances have occurred of the capture of single individuals of this rare straggler in Norfolk, in almost all its different stages of plumage.

Raven, *Corvus corax*. Is found in Norfolk throughout the year, and breeds in the county, but in small, and apparently decreasing numbers. Sir Thomas Browne, in speaking of the raven at Norwich, makes the following curious observation. "In good plenty about the city, *which makes so few kites to be seen hereabouts.*"

Carriion Crow, *Corvus corone*. Is found in Norfolk throughout the year, and breeds with us, but is a much less common species than in many other counties.

Hooded Crow, *Corvus cornix*. The hooded crow is a very numerous winter visitant, arriving on our coast about the end of September, and departing in April. We have observed this species near the mouth of the river Yare, hovering over the water in search of food, after the manner of the terns. We were unable to ascertain precisely the manner in which the prey was secured, but although a bird was once seen to rise with something in its beak, we are inclined to believe that the object was, in the first instance, grasped with the feet.

A pair of these birds are said to have nested in the year 1816, in the neighbourhood of Lynn; and an instance of its occurrence in the Marshes, near Yarmouth, in the month of July, is recorded in the 'Zoologist,' (Zool. 315).

Rook, *Corvus frugilegus*. Very common throughout the year, and breeds with us.

Jackdaw, *Corvus monedula*. Common throughout the year, and also breeds in Norfolk.

Magpie, *Pica caudata*. The magpie is found in Norfolk, remains throughout the year, and breeds; but except in the western part of the county, where it is tolerably plentiful, it is a much less numerous species than in many other districts.

Jay, *Garrulus glandarius*. Common throughout the year, and breeds in Norfolk.

Nutcracker, *Nucifraga caryocatactes*. A specimen was killed at Rollesby, near Yarmouth, October 30th, 1844, a notice of which will be found in the 'Zoologist,' (Zool. 824). It is the only instance that has come to our knowledge of the occurrence of the species in Norfolk. A nutcracker was taken some years since at Southwold, in Suffolk.

Great Black Woodpecker, *Picus martius*. Two specimens of the great black woodpecker are recorded to have been killed some years since at Scole, in this county.

Green Woodpecker, *Picus viridis*. Common throughout the year, and breeds with us.

Great Spotted Woodpecker, *Picus major*. Is found in Norfolk throughout the year, and breeds with us, but is not a very numerous species.

Lesser Spotted Woodpecker, *Picus minor*. Is a rare bird, but remains throughout the year, and breeds in Norfolk.

Wryneck, *Yunx torquilla*. The wryneck is a regular and not uncommon summer visitant in Norfolk, arriving in April, and departing in September, and breeds in the county.

Common Creeper, *Certhia familiaris*, Wren, *Troglodytes Europæus*. Common throughout the year, and nest with us.

Hoopoe, *Upupa Epops*. The hoopoe is not of very unfrequent occurrence in Norfolk, appearing at irregular intervals, and generally in the autumn. It has occasionally been observed in pairs, and even in small flocks, but in most cases the examples are solitary.

Nuthatch, *Sitta Europæa*. Common throughout the year, and breeds in Norfolk.

Common Cuckoo, *Cuculus canorus*. A common summer visitant, and breeds with us. A cuckoo agreeing in colour and markings, with the red cuckoo of Temminck was killed at Letton on the 5th of May. The Coucou roux is considered by the above naturalist to be the common or grey cuckoo of the age of one year. As this variety of the cuckoo is seldom met with in this country, the remarks of M. Tem-

minck upon the point are perhaps worth transcribing. "L' oiseau que les naturalistes signalent sous le nom de Coucou roux ne me paraît autre chose qu'un état différent du Coucou gris, probablement ce même oiseau âgé d'un an. Plusieurs naturalistes ont pris le jeune coucou pour le Coucou roux parce-que la livrée du jeune âge offre toujours quelques légères traces de raies rousses ;

* * * * *

D' autres ont voulu faire passer le Coucou roux pour femelle du gris ; mais ceux-la se trompent également, car il n' existe aucune différence dans le plumage des sexes ; plusieurs Coucous roux que j'ai disségués étaient mâles."

Roller, *Coracias garrula*. The roller is a very rare bird in Norfolk, but several well authenticated instances have occurred of its capture in the county.

Bee-Eater, *Merops apiaster*. The bee-eater has also, in a few instances, been taken in Norfolk, but it must be considered as a very rare visitor.

Kingfisher, *Alcedo ispida*. Common throughout the year, and breeds in the county ; its numbers being increased in the months of August and September by migratory arrivals on the coast.

Swallow, *Hirundo rustica*, Martin, *Hirundo urbica*, Sand Martin, *Hirundo riparia*. Very common in summer, and breed in Norfolk.

Swift, *Cypselus apus*. A common summer visitant, and nests with us.

White-bellied Swift, *Cypselus alpinus*. A specimen of the alpine swift was taken at Old Buckenham in Norfolk, in September, 1831.

Nightjar, *Caprimulgus Europæus*. A common summer visitant in most heathy and sandy districts, arriving in May, and departing about September. It lays its eggs about the middle of June. During the day the nightjar seems to be fond of basking in the sun or the side of a dry ditch or sandy hollow, from which situations, we have frequently disturbed it.

Ring Dove, *Columba palumbus*. Very common throughout the year, and nests with us.

Stock Dove, *Columba ænas*. Also common throughout the year, and breeds in the county ; but is less numerous and more local than the preceding species. It is most plentiful in the neighbourhood of rabbit warrens, nesting in the deserted burrows.

Turtle Dove, *Columba turtur*. A common summer visitant, and nests in Norfolk, but is probably less numerous than in the more southern counties.

Common Pheasant, *Phasianus colchicus*. Common throughout the year, and breeds with us.

Black Grouse, *Tetrao tetrix*. Black game have at different times been turned out in Norfolk, but have hitherto increased very little. A few birds are, however, occasionally met with in those parts of the county where the attempt has been made to introduce them.

A gentleman informs us that he recollects a specimen of the red grouse (*Lagopus Scoticus*), being killed many years since in West Norfolk, we believe not far from Downham. It is, however, possible that this may have been a young bird of the preceding species. Sir Thomas Browne, in his account of Norfolk birds already referred to, has the following paragraph. "The heathpoult, common in the North, is unknown here, as also the grouse; though I have heard some have been seen about Lynn."

Common Partridge, *Perdix cinerea*. Very common throughout the year, and breeds in Norfolk.

Red-legged Partridge, *Perdix rufa*. The red-legged partridge is very common on most of the light lands in Norfolk, remaining through the year, and breeding. From its disinclination to rise, and its habit of running before the dogs, it is considered useless to the sportsman, and from its pugnacious disposition, is supposed to interfere with the nesting of the common species. Its eggs are in consequence often destroyed by gamekeepers, by which means, its increase is greatly checked. Sir Thomas Browne says, "Though there be here very great store of partridges, yet the French red-legged partridge is not to be met with."

It was introduced into this part of England, in the course of the last century, but has also been occasionally known to migrate to our coast, and may, therefore, be claimed as a Norfolk bird, independently of its introduction by artificial means.

Virginian Colin, *Ortyx Virginiana*. Some of these birds were turned off several years ago by the late Earl of Leicester, in the neighbourhood of Holkham; and, there is reason to believe that the species still exists in small numbers in the county.

Common Quail, *Coturnix vulgaris*. A regular summer visitant, and nests with us. Its numbers are however very limited, and it is very local in its habits, showing a decided preference to sandy soils. It was formerly a far more numerous species in Norfolk than at present; so much so, that fifty years ago it was not uncommon for a sportsman to kill on light lands early in the month of September, three or four brace of these birds in a day. We have never heard a

satisfactory explanation of this great diminution in the numbers of the quail.

A nest containing eleven eggs, very recently laid, was taken in a grass field, near Yarmouth, on the 15th of last August.

Great Bustard, *Otis tarda*. We fear that this noble bird must now be considered as extinct in Norfolk, though it has only recently become so. It is perhaps doubtful, whether the bustard was at any time a very numerous species in this county. It is only twice mentioned in the household accounts of the Lestranges,* kept in the reign of Henry VIII, and Sir Thomas Browne, a hundred and fifty years later, merely says that they "are not unfrequent in the champion and fieldy part of this county."

Little Bustard, *Otis tetrax*. The little bustard, has at different times occurred in this district, but must be considered as a very rare visitor.

Great Plover, *Ædicnemus crepitans*. A common summer visitant to the open sandy parts of the county, where it breeds about the end of May. It arrives in April, and departs towards the end of September.

We have found the remains of the forceps of several earwigs in the stomach of one of these birds.

Collared Pratincole, *Glareola torquata*. Has occurred several times in this district, but only as a very rare and occasional visitant.

Golden Plover, *Charadrius pluvialis*. This species appears in Norfolk in the month of October, and is found occasionally in flocks throughout the autumn and winter months, with the exception, perhaps of occasional southward migrations in very severe weather.

Its northward migration takes place in May, and we have observed it in Norfolk as late as the 25th of that month, in the perfect plumage of the breeding season.

Instances are said to have occurred of the nesting of the golden plover in Norfolk, but as far as we have been able to ascertain, none of them have been well authenticated.

Dotterel, *Charadrius morinellus*. The dotterel occurs in small numbers in its migrations to and from its breeding grounds. It appears in the month of September, remaining but a short time, and returns in March. It seems to remain longer on its northward than on its southward migration, for we have noticed its occurrence so late as the 20th of May.

* Household and Privy Purse Accounts of the Lestranges of Hunstanton, from A.D. 1519 to A.D. 1578.

An observation of M. Julian Deby in the concluding part of his paper on the birds of Belgium, appears to throw some light upon this circumstance. That gentleman remarks (Zool. 1251) that the dotterel *does not return through Belgium in the spring*. It would, therefore, appear that this species, though passing in its southward migration along the coasts both of Belgium and England, returns to its breeding grounds by a more westerly route, altogether avoiding the former country.

Ringed Plover, *Charadrius hiaticula*. This species is found on our coast, throughout the year, and breeds with us, generally on the beach, but occasionally in sandy places further inland. Its numbers are increased in spring and autumn by migratory bodies, respectively proceeding northward and southward, and it is probable that a much greater proportion of these birds go to the south of this district in severe than in mild winters.

Kentish Plover, *Charadrius Cantianus*. The Kentish plover is not a common bird in Norfolk, but occasionally occurs in spring and autumn, most frequently in the months of April and September.

Gray Plover, *Squatarola cinerea*. Not uncommon in autumn and winter, but arriving later than the golden plover.

Specimens sometimes occur as late as the last week in May, when they have acquired the full plumage of the breeding season.

Peewit, *Vanellus cristatus*. Common throughout the year, and nests with us, but is less numerous than formerly.

Turnstone, *Streptilas interpres*. The turnstone is found on our coast, but not in large numbers, arriving in autumn in the month of August, and returning northwards in spring, at which season we have observed it as late as the 26th of May. In severe weather most of these birds leave us for more northern districts.

Sanderling, *Calidris arenaria*. The sanderling is found on our coasts, but like the preceding species, only in limited numbers. It arrives early in autumn, and by the 25th of October, as is accurately observed by Mr. Yarrell, it has obtained its full winter plumage. It is occasionally seen as late as the last week of May.

The numbers of this species are somewhat smaller on the coasts of Norfolk, in the depth of winter than in spring and autumn.

Oyster Catcher, *Hæmatopus ostralegus*. Common throughout the year on the coast, where it breeds, but is probably less numerous than formerly.

Common Crane, *Grus cinerea*. A bird of this species, ascertained by dissection, to be a female, was shot by a labourer at Kirkley, near

Lowestoft in Suffolk, in the month of April, 1845. It was walking slowly in a barley field, apparently intent on searching for food, and was killed without difficulty. The wind had for some time previous been easterly. We are not aware of any other recent instance of the occurrence of the crane in this district. "Cranes," says Sir Thomas Browne "are often seen here in hard winters, especially about the champian and fieldy part. It seems they have been more plentiful, for in a bill of fare when the mayor entertained the Duke of Norfolk, I met with cranes in a dish." This surmise is probably correct, for in the household accounts of the Lestranges, already quoted, the crane although not very often mentioned, is only valued at 6d. The "cranne" is one of the first birds mentioned in these accounts, as having been killed with the gun in the year 1533.

Common Heron, *Ardea cinerea*. Common throughout the year, and breeds with us.

The discontinuance of hawking, of which herons were the favourite victims, and for which they were carefully preserved, and the consequent dispersion of the larger heronries, has caused the establishment of numerous smaller colonies of these birds, but the number of herons which frequent most of these localities is very limited. The herons begin to repair to their nests early in February, and leave them about the end of August, dispersing themselves through the marshy parts of the county during the remaining months. They usually rear two broods in the course of the year, and a notion is prevalent among the country people, that the second set of eggs, is incubated by the young birds of the first brood. It is perhaps worth remarking, that when the herons drop any of the food which they bring to their young, among the trees of the heronry, they make no attempt to recover it, but, probably from a consciousness of their inability to rise from the ground in a confined space, allow it to remain where it falls.

The food of the heron is well known to be somewhat miscellaneous. During the nesting season, it appears to consist chiefly of eels, and water rats, the fur of which latter they are observed to reproduce in pellets, after the manner of birds of prey.

We may add that we have found the remains of water beetles and boat-flies in the stomach of this species.

Purple Heron, *Ardea purpurea*. Occurs in Norfolk, but is a rare and accidental visiter. It is probably this species which is described by Sir Thomas Browne under the name of "Black Heron."

Great White Heron, *Ardea alba*. With the exception of the Suffolk specimen, mentioned by Messrs. Sheppard and Whitear, we

know no instance of the occurrence of the great white heron in this district.

Squacco Heron, *Ardea comata*. Has occurred in the eastern counties, but only as a very rare and occasional visitant.

Little Bittern, *Botaurus minutus*. Birds of this species, though far from common in Norfolk, have occurred several times, principally in the spring months, and occasionally in a manner which made it probable that had they not been disturbed, they would have nested in the county; in confirmation of which we may add, that a female, killed near Lowestoft, was found upon dissection to contain a perfect egg.

From an inspection of the specimens, obtained from time to time in this district, we incline to the opinion, that if the females of this species ultimately arrive at a plumage similar to that of the adult males, as is asserted by modern naturalists, it is only at a much more advanced period than that at which the same plumage is assumed by the latter; and it appears quite certain that the female, in the supposed immature plumage, pairs with the adult male.



Young of the Common Bittern.

Common Bittern, *Botaurus stellaris*. Is found in this district

throughout the year, and nests with us, but its numbers are very limited, and evidently decreasing.

We have reason to suppose that the numbers of this species are augmented during the winter months by occasional migratory arrivals. The bittern is mentioned in the household accounts of the Lestranges, and also by Sir Thomas Browne, who says of one which was kept in a garden, that in default of its usual food "making a scrape for sparrows and small birds, the bittour made shift to maintain herself upon them."

The young bird represented in the engraving, was taken at Ranworth several years ago, by Mr. D. B. Preston, from the nest, in which an addled egg was also found.

Night Heron, *Nycticorax Gardeni*. Has occurred several times in this district, but is an uncertain, and of late years a very rare visitant.

A specimen was killed several years since at Yarmouth, which had a larger number than usual of long white feathers growing from the back of the head, from which circumstance, and from the greater straightness and rigidity of these feathers, it was supposed to be a distinct species. We have no doubt, however, upon an examination of the bird in question, that it belongs to the species under consideration, and that the distinctions above mentioned may be referred to the more perfect plumage of the adult bird. It is mentioned in the list of the Messrs. Paget as the "Cayenne Night Heron."

White Stork, *Ciconia alba*. One or two of these birds are generally killed in Norfolk every year, generally during the spring months, and in the vicinity of the eastern coast.

White Spoonbill, *Platalea leucorodia*. Occurs in Norfolk in nearly the same numbers, but is somewhat more frequently taken in autumn, and is less confined to the eastern coast, than the preceding species.

It is said by Sir Thomas Browne that it "formerly built in the hernery at Claxton and Reedham; now at Trimley in Suffolk." The spoonbill has long ceased to breed in this district.

An adult male spoonbill which was killed in Norfolk, fell far short in all its admeasurements of the usual size of the species. It is probable that this effect was produced by an old fracture of the thigh-bone, which was discovered when the bird was dissected for preservation.

Glossy Ibis, *Ibis falcinellus*. Has occurred of late years in Norfolk only in small flocks, and at very long and uncertain intervals, but

it is supposed by some naturalists to have been formerly more common.

Common Curlew, *Numenius arquata*. The curlew is occasionally found in Norfolk in the summer months, but we are not aware of any instance of its breeding in the county. The large body of curlews arrives in the months of September and October, and it is a common species in the neighbourhood of the coast throughout the autumn and early spring, and also in winter, except perhaps in very severe weather. The curlew is repeatedly mentioned in the accounts of the Lestranges, and the following entry among others, shows that at that time it bore a high price. "Itm pd. at Snetishm M'kett for iij curlewes ijs."

Whimbrel, *Numenius phaeopus*. Occurs in much the same manner as the species last mentioned, but in decidedly smaller numbers. We have reason to believe that it is this species which is occasionally mentioned in the accounts of the Lestranges as the "Spowe."

Spotted Redshank, *Totanus fuscus*. Not uncommon about the end of summer and early in autumn, the specimens so occurring being generally young birds; it is also occasionally obtained at other periods of the year, and we have seen examples killed in the spring, which had nearly attained the full plumage of the breeding season.

Common Redshank, *Totanus calidris*. Common throughout the year, and nests with us, laying its eggs about the end of April; a few individuals probably go further south in severe weather, and their numbers are somewhat increased in spring and autumn by migratory birds, respectively proceeding northwards and southwards.

Green Sandpiper, *Totanus ochropus*. Occurs in some numbers, both in the vicinity of the coast, and in the inland marshy districts of the county, and a few well authenticated instances of its breeding in Norfolk are on record. We have observed it about the end of July, but its principal migratory movements may be considered to take place towards the end of August, and in the months of April and May.

Wood Sandpiper, *Totanus glareola*. Occurs occasionally in Norfolk, at the beginning and end of summer. We are informed by Mr. Scales, that several years ago, he shot two of these birds during the summer in a marsh near Beachamwell, one of which was an old female, and the other a young bird, not yet having entirely lost its down; and the latter, which we have endeavoured to represent,

being evidently not sufficiently feathered to have crossed the sea, may fairly be supposed to have been hatched near the spot where it was killed.



Young of the Wood Sandpiper.

Common Sandpiper, *Totanus hypoleucos*. Not uncommon on our coast in autumn and early spring, and also occurs in summer, but we know no well authenticated instance of its breeding in the county. It generally retires further south in severe weather.

Spotted Sandpiper, *Totanus macularius*. An example was killed at Ranton near Cromer, September 26th, 1839; the only instance we know of the occurrence of this species in Norfolk.

Greenshank, *Totanus glottis*. Occurs in spring, leaving us about the end of May, and is again found in the months of September and October, on its return from its breeding grounds; but at neither season in large numbers.

(To be continued).

NATURALIST'S CALENDAR FOR APRIL.

BIRDS.—During this month the greater part of the summer birds arrive. About the 2nd or 3rd, a few swallows (*H. rustica*) sometimes appear, but the great body of these birds seldom reaches us till towards the end of the month. The soft note of the willow wren (*Phyllopneuste Trochilus*) is heard, in very early seasons, on the 1st or 2nd, but more usually about the 9th or 10th. The wryneck (*Yunx torquilla*), tree pipit (*Anthus arboreus*), common whitethroat (*Sylvia cinerea*), and the lesser whitethroat (*Sylvia curruca*), are generally here by the middle of the month. The nightingale (*Luscinia Philomela*) arrives between the 6th and 20th; and the whinchat (*Saxicola rubetra*), reed warbler (*Calamoherpe arundinacea*), sedge warbler (*Calamodyta Phragmitis*), and yellow wagtail (*Budytes Rayi*) mostly reach us by the 24th. The wood wren (*Phyllopneuste sibilatrix*) may be heard in tall trees in woods about the 19th, although in some seasons it is not here till quite the end of the month. The garden warbler (*Curruca hortensis*), swift (*Cypselus apus*), and red-backed shrike (*Enneoctonus Collurio*) reach us about the end of the month. The green sandpiper (*Totanus ochropus*) may sometimes be seen in pairs at ponds, and the common sandpiper (*T. hypoleucos*) arrives in this month, and may often be met with on the margins of streams.

INSECTS begin to be numerous at this time of year; several of the butterflies appear; the beautiful little wood blue (*Polyommatus Argiolus*) may frequently be seen settling upon the leaves of evergreens, such as hollies, laurels, &c.; the various white butterflies (*Pontia*), the elegant orange-tip (*Anthocaris Cardamines*), the wood Argus (*Satyrus Aegeria*), the spotted and dingy skippers (*Thymeles Alveolus* and *Tages*), come forth from the chrysalis. The emperor moth (*Saturnia Carpinii*) appears, and the males may frequently be seen in the afternoon, flying rapidly in search of the females. The rare prominent moth (*Lophopteryx Carmelita*) is sometimes, though very rarely, met with at this time, and on the later flowering shallows many moths will be found; among them *Orthosia rubricosa*, *gracilis* and *populeti*, and in the northern counties, *Orthosia opima*. This species has not been known to inhabit Britain till within the last two years, and was discovered at York by T. H. Allis, Esq. — *H. Doubleday*; in *Naturalist's Almanack* for 1845.

Submergence of the Moorhen. In the last number of the 'Zoologist' (Zool. 1255), I see allusion is made to the submergence question, the two sides of which were severally advocated by Mr. Slaney and myself. When I left Mr. Slaney's last notes on the subject (Zool. 877) unreplied to, I was partly, at least, influenced by the hope that other observations on the subject might be recorded. And now that the question has been again referred to, I will forward the remarks which I noted down soon after the perusal of Mr. Slaney's last communication. I should scarcely however venture to trespass further on the pages of the 'Zoologist,' and the patience of its readers, by additional remarks upon an already trite subject, were it not that I desire, so far as I may, to add to the amount of correct information on matters connected with Natural History. In his notes (Zool. 877) Mr. Slaney appears to overlook the fact that the point at issue between himself and me, is limited to the question or subject of *complete* or *entire* submergence; and that my arguments are not intended to apply to *partial*

submergence. And yet, if he will turn to my paper (Zool. 757), he will observe that I have expressed myself thus : — “ If then W. H. S. maintains that moorhens or any other birds, can keep themselves in what I call a *state of submergence*, without the aid of weeds or flags, or other objects external to themselves, I beg leave to differ from him. If he means only that the moorhen, together with various other birds, is capable of maintaining itself in what I call a *partially submerged* state, I cordially agree with him.” As I have said, then, he must have overlooked this, when penning the notes to which I have referred ; for at the commencement he writes, “ On the 31st of January last, I had the most perfect and complete opportunity of observing a moorhen while *partially* submerged.” The observations then, made at that time, and recorded in the ‘Zoologist’ (Zool. 877), go for nothing as to the point really at issue; that point being the question of *complete* submergence. I have already defined what I mean by “ submergence,” clearly and accurately (Zool. 497 and 756) : and, so far as I could, took all pains not to be misunderstood. My definition is as follows : — “ remains submerged, with *merely its BEAK thrust out* for the purpose of respiration ; ” and surely there ought to be no misunderstanding or mistake in the case of such a definition as this. Now in his account (Zool. 877) Mr. Slaney says, first, “ it reappeared with its head and neck only above the water ; ” next (Zool. 878), “ it appeared once more amongst the flags, at first with its head only above the water ; ” and lastly, “ at first, only the head and neck were raised above the surface ; but shortly it raised up the upper part of the body also, leaving all the under portion of the body, and all but the head, neck, and just the top of the back and tail completely under the water, and in that state,” &c. “ And its remaining in that position was totally without the aid of any hold upon the flags or weeds, for I could distinctly see the *feet* gently moving in the water, to resist the current and to keep the bird stationary.” Now to what does the fact here recorded amount ? Simply to this. The moorhen is seen in what Mr. S. himself calls a *partially* submerged state, and does not use its feet, as instruments of grasping, to maintain itself therein : a matter, that is, which I have never disputed, and have stated over and over again. Further, I am not quite sure on what grounds Mr. Slaney applies the phrase “ hypothetical strictures ” to my remarks on his “ former observations.” I state as a *fact*, not as an *hypothesis*, that I have *seen* the moorhen’s feet—the bird being veritably submerged at the time—actually employed as the means of retaining its submerged position by their grasp upon the weeds. And I add the *fact*, not the *hypothesis*, that when I have shot the moorhen in its submergence, on taking it from the water, I have found fragments of weed yet in the grasp of the feet. I think, moreover, that Mr. Slaney underrates the tenacity of weeds, (Zool. 878). When decayed, of course they are frail enough. But how long do decayed weeds maintain their erect position in the water ? Is not one of the very first effects of decay upon the weed, that the mass gives way and sinks entirely ? So long as they *stand*, if I may use the phrase, I think they would be sufficiently strong to hold the moorhen down : and when fallen, they would be out of the moorhen’s reach. Besides, what a “ goose ” the bird must be, if, on finding that the first bit of weed laid hold of, was giving way, it did not “ mend its hand ” by renewing its hold or changing its place. Depend upon it, a moorhen knows better than to be foiled by any failure of this kind : and depend upon it too, that when weeds are yet within a few inches of the surface, they are strong enough for the moorhen’s wants. And moreover, surely Mr. Slaney, who maintains that a submerged moorhen requires *no* assistance — not even that of a rotten weed — to maintain itself in its submergence, should not argue that a rotten

weed would be insufficient for such purpose. It seems to me that Mr. Slaney has either misunderstood the point at issue between us, a suspicion not diminished by the perusal of his notes (Zool. 877), or that he has, as M. Deby seems to think, "formed his opinions" "too hastily." I shall say nothing on the former supposition: and on the second, I would ask him to consider, first, the facts I have produced. And I will add here, that of dozens of moorhens that I have seen submerged, together with not a few coots, I have never seen one submerged *where there were not weeds*. Let him consider next the argument to the effect that if the bird maintains its position of submergence by the means he asserts it does, it ought, by every law, and for every reason, to *sink* instead of to *float*, when shot in its submerged state, and made considerably heavier by the pellets of lead lodged in it. Let him consider, thirdly, the reasoning of M. Deby, (Zool. 1255). Let him, in the fourth place, recollect that a bird never sinks when dead, and although saturated with water as to its feathers, and filled with water as to its lungs, and the other cavities of its body to which the water can penetrate. And fifthly, let him not forget that the lungs of a submerged bird always contain a certain portion of air. Respiration goes on as usual during the period of submergence; for the beak, though only the beak, is always above water. And consequently it must be a marvellously unaccountable power, of whatever kind, by which the bird succeeds, with instant volition, in making its body, with such an air-filled cavity, still all but equally heavy with water. And lastly, he will have to account for the circumstance that the moorhen does not oscillate in its suspension in fluid, as man does, during the process of respiration: when, *this* instant, the body expands with the inspiration, and therefore becomes specifically lighter, and the next contracts with expiration, and therefore becomes specifically heavier; and consequently alternately rises and falls. I think if Mr. Slaney will take the trouble to get a clear view of the point I contend for, and attentively to consider these six or seven particulars of fact or argument, he will feel himself constrained to abandon his position as untenable; supposing that position to be, that a moorhen can maintain itself in a state of *total* (and not *partial*) submergence, as above defined, without the aid of external substances, whether grasped by the feet, or otherwise acting.—J. C. Atkinson; Scarborough, March 21, 1846.

Note on Cygnus atratus. I was much surprised at a note of Mr. King's, which has lately appeared in the 'Zoologist' (Zool. 1214), in which, while attempting to disprove as fabulous the "singing of swans of the *ancients*," he makes the very subject of his problem a bird with which the "*ancients*" were not acquainted. It was my first intention merely to have answered him in a few words, but the subsequent inquiries which I have made, have enabled me to draw up more copious observations, which I think are of sufficient interest to be given at length. Surely Mr. King must be aware that the singing of the *Cygnus atratus*, which he has so elaborately proved, and of which he feels "called upon to act as the champion," has nothing whatever to do with the "singing of swans of the *ancients*." The *Cygnus atratus* was a bird totally unknown to them. Their idea of a black swan, as we shall shortly see, was just as imaginary as it was of a white crow. If Mr. King is a native of Australia, he cannot possibly be ignorant that the black swan is not only his own, but *exclusively* his own, countryman. It was first discovered in New Holland about the year 1698. In Latham's 'History of Birds,' published in 1824, I read the following particulars. "The first mention of it was made in a letter from Mr. Witsen to Dr. M. Lister, about the year 1698, which says, here is returned a ship, which, by our East India Company, was sent to the South Land, called *Hollandia Nova*; and adds, that black swans, parrots

and sea-cows were found there. In 1726, however, two of them were brought alive to Batavia and confirmed by Valentyn." Whether the "singing" either of white or black swans is true, I know not; nor is that of any importance to the subject of this communication, as what I am simply endeavouring to show, is, that the bird which Mr. King refers to, and from which he draws his deduction "that the singing of swans of the *ancients* is not fabulous," was a bird altogether unknown to them, and that therefore his deduction is erroneous. And, in order to do this, it will not be sufficient merely to bring forward the previous statement of its first discovery on record (however good may be the authority which that statement rests upon), but also to adduce independent proof, from altogether independent sources, that the bird in question was decidedly unknown: for, without this, no ornithologist of the present day could be prepared to affirm *for certain*, that the *Cygnus atratus* did not once exist in countries from which it has long retired, and that, for some cause unknown to us, it may have migrated from other lands to what has been long considered, and in fact really is, its sole remaining locality,—Australia. I grant that such an assumption is an exceedingly improbable one; but, so long as it is possible, proof of the non-existence is actually necessary to establish the point. And as one of the foremost, I would mention, that it is altogether unnoticed in Pliny's 'Historia Naturalis.' But, perhaps, Mr. King's ideas were rambling off amongst the satires of Juvenal, and "floating free," involuntarily fixed themselves on that well-known simile, so familiar to us all, containing, as I believe it does, the only mention of a black swan in the whole bulk of classic authors combined. I, of course, refer to "*Rara avis in terris nigroque simillima cygno*" (Sat. vi. 165), in which "*nigro cygno*," considered by the poet as the greatest impossibility in nature, is put in opposition, ironically, to "*mulier casta!*" The fact is, the whole satire being a bitter invective against the ladies of Rome, and most unsparing in its exposure, Juvenal does not cloak his censure when he likens their virtues not to a thing which may occasionally, though seldom exist; but rather to a physical impossibility; to what in the estimation of the age in which he lived, could not possibly by any means occur. Being anxious, moreover, not only to expose, but exaggerate their faults, he does not scruple to express his sentiments, and declares that a "*mulier casta*" is but another name for an *impossibility*; and asserts, satirically, that, if such a thing could exist (as he allows was once the case, when, by the intervention of the Sabine women, the war between the Romans and Sabines was put an end to), the fact would be so rare and extraordinary, and the person thus constituted such a "*rara avis in terris*" (a rare bird upon the earth) that he could liken her only to a black swan ("*nigro cygno*"), *i. e.* to the thing in nature most unlikely to occur, and therefore the greatest impossibility he could fix upon! To show exactly the force of the above quotation, I will just mention one more expression, which the poet, in the next satire, uses precisely in the same manner (only directed against the opposite sex), when he likens such fortunate men as Quintilian, Ventidius, or Tullius to "white crows." He says

"*Felix ille tamen corvo quoque rarior albo.*" (Sat. vii. 202).

"Yet that fortunate person is also more rare than a white crow." In which, as before, an impossibility, as they considered it, is chosen, to give greater force to the expression, and to show how extremely rare such lucky men must be; or, rather, how impossible it is they could ever exist at all, unless Fortune smiled upon them at their birth. And, in like manner, many other examples of this common form of speech might be brought forward; but why need we fly to antiquity for them, when we have idioms in

our own language exactly parallel? A day scarcely elapses without the sentiment joyously echoing in our ears, "that such and such a thing is just as likely to take place as a pig to fly." Which at once expresses in familiar language the force of the above quotations. In fact, the very essence of them may be simply put down thus. Such a person would be "a bird so rare upon the earth, that you might just as well expect a swan to become black," as a novelty of that sort to exist. And the second, in like manner, may be expressed as follows: "A fortunate man (like Quintilian) is so uncommon, that you might as well expect a crow to become white," as for many to occur like him, unless born under the same stars. By which it will be seen, that, so far from being known to the ancients, "Black Swans" and "White Crows" were not only considered impossible, but the very idea of them so ridiculous, that they were actually selected as the absurdest examples of improbability for their comparisons to be opposed to. And, furthermore, it is worth observing, that, whether in prose or verse, throughout the whole series of Latin authors (when not speaking ironically) I can discover but one epithet, referring to colour, applied to *Cygnus* (or, which is the same thing,—to *Olor*) in addition to the constantly recurring ones of *albus*, *niveus*, &c., all of which have the same meaning, viz., "white." The one I refer to is *purpureus*. It is used in Horace (Ode I. Carmen 10):

"*Purpureis ales oloribus.*"

But it is evident that "*purpureis*" only means splendid, shining, or glittering, as indeed it does in numberless cases. Witness the two following:

"*Nivem purpuream,*" (Lactant. de Phœnice, 74),

which cannot mean the purple snow. And

"*Aëra purpureum,*" (Claud. 29, 7)

which cannot possibly mean the purple air. The ancient poets used to call any strong or vivid colour by the name of "purple" (without any reference to the actual hue), because that was their richest colour. Thus "*purpureum mare,*" "*purpureæ comæ,*" "*purpureo capillo,*"—from whence also our own poet, Spenser,

"The morrow next appeared with *purple* hair."

from which data, two deductions are apparent. First: that the old epithets of "*niger*" and "*purpureus*," when applied to the swan, have no reference whatever to their actual colour (the *one* being merely used ironically and the *other* figuratively). Secondly: that no such thing as a black swan, to their knowledge, was in existence, (the expression being satirically used as the very acme of an improbability). If, therefore, Mr. King, when in the name of the black swans of Australia, he stood forward so gallantly and bore testimony to the accomplishments ascribed to them by the ancients; if his opinions of their notoriety in the golden or silver ages of Roman literature; *i.e.* in the ages of Horace or Juvenal,—alone rested on the epithets we have discussed; let him review the above observations, and, if he considers them correct, let him own himself convinced. If he does *not* consider them correct, then let him retain his own opinions; let him assume that the *first* epithet we have referred to was *not* used "ironically," and that the *second* was *not* used "figuratively:" but let him also take into account the record of its discovery in 1698, which we have already mentioned, and he will find he has two intolerable difficulties to surmount. First: the concurrence of commentators in the passages to which we have referred. And secondly: the truth of a statement which we have no warrant to suspect. I can, of course, anticipate his reply; viz., that although black swans were mentioned, his observation was equally true for white ones, as both have much the same habits, and therefore, if one is loquacious, *è consequentiâ*,

the other must be also. But this, I would remind him, is but shallow reasoning and inadmissible in argument, to say nothing of the question still remaining unsolved, whether the two species are the same in habit; and that, therefore, if the black one's note is, by observation, melodious, that of the white must of necessity be so too. Passing over, I say, this important problem, which, were we to analyze it, might afford us much additional information, and leaving unnoticed every ultimate result, I would lastly observe, that, in a record of facts (which experience has shown is so admirably supplied in 'The Zoologist') it is indispensably necessary that facts alone should be adhered to, otherwise how can we distinguish between what is true and false? The place is supplied by no other periodical of the day, and it is to it, therefore, that we must go for much valuable information which would otherwise be unrecorded and lost. And if I might here add a few words in its favour, and answer those paltry objections which many vain-glorious pretenders have ignorantly urged against it, who would hoist the banner of what they call "science" over an "accumulation of mere facts," and endeavour to crush to the ground even Nature herself by the distorted image of her, which they themselves have erected, crying aloud "*cui bono*" to all our observations; if I might here declare but one opinion amongst a thousand, which, each day, are gaining ground perceptibly, and which will advance in the world as knowledge progresses onward, in spite of all their cavilling; I would ask such men, on what firmer rock they would establish themselves than truth? If fact, undisturbed by theory (which is the very essence of truth, and of which science in its noblest form, is, in the first instance, itself composed) be not worthy of record,—what is? However promiscuous and unarranged facts may be, still they are "facts," and ought to be regarded as such. Nor because they are small, ought they to be considered beneath our notice, for have not the grandest discoveries been made through study of the simplest truths? Would not Newton have borne testimony to this in the theory of gravitation—one of the mightiest discoveries which the human mind has hitherto been capable of? And, if we can adduce examples of other truths brought to light by the same means, I ask any candid person to consider, whether, as the world advances in knowledge, still greater men may not yet arise and open to view, even through the humblest media, truths as yet undreamt of, and only slumbering to be uprised by a second Newton to a more glorious existence? Should then practical naturalists be still branded with the names of "mere observers," "species-men," and the like; let them remember how high a privilege it is to be classed under such denominations. Was it but the work of man on which their labours were expended—some useless question of mythology—or some vain and endless discussion of technicalities, on which nothing depends, and from which no good can be derived, and which only cramps the mind, and renders it unfit for receiving wider and nobler truths: then indeed might their fears be not without foundation, that their labour is partially in vain. But in Nature nothing happens by chance. Unlike the works of art, which are merely the results of individual knowledge, and (what is shallower still) of individual taste; there are in Nature, from the humblest to the loftiest objects, fixed laws by which every thing is regulated and balanced, and without which nothing could stand. To discover these laws and afterwards to deduce grander truths for our own benefit, is undoubtedly the cause for which those laws were established. And, inasmuch as this can only be accomplished by an accurate observation of *facts*, how can that be better attained than by affording a general receptacle into which every kind of truth may be received? For, although piecemeal, it is of comparatively small importance, yet when collected into a body, it

forms a solid mass of knowledge, which theories may indeed be built upon, but which they can never, in the smallest degree, undermine.—*T. V. Wollaston ; Jesus College, Cambridge, February, 1846.*

[For my own part I feel extremely obliged to Mr. King for making known through the pages of 'The Zoologist,' one of the most pleasing and valuable natural-history facts that has ever appeared in print. Mr. King "feels inclined" to act "as the champion" of swans generally, in regard to their singing, because he has heard one of the genus sing sweetly. I must say I should have entertained a similar desire, had my good fortune been equal to his. Indeed, I do not value Mr. King's paper a whit the less for having called forth Mr. Wollaston's criticisms. I believe, however, that Mr. Wollaston need not fear any of the *fact*-naturalists contending that the Cycni of the poets were the black swans of Van Diemen's Land. Most of my readers will, I dare say, recollect a passage in 'Rusticus,' which tends to show that the poets did not always hail the swan as a *melodious* bird of song.—*Edward Newman*].

Occurrence of the Purple Heron near Penzance.—I have seen this afternoon a very perfect and adult specimen of the purple-crested heron (*A. purpurea*), which was killed two days ago in a small sedgy grove under Killiow House, the residence of William Daubuz, Esq., about two miles westward of Truro. That gentleman has written to me announcing his having sent the bird for preservation to Mr. Vingoe of this place, and I have in consequence had a good opportunity of examining the bird. It is in every respect in perfect plumage, and all its plumes are uninjured. It was seen flying about the grove, where there are two large ponds, on Monday last. In condition, the bird is extremely emaciated. Does not the appellation *purpurea* claim a "*lucus non lucendo*" as regards the heron? I never saw less purple about any bird. How much more apposite is Latham's term *rufa*!—*Edward Hearle Rodd ; Penzance, April 11th, 1846.*

Snipe in captivity.—To those who may wish to domesticate the snipe in aviaries, it may be interesting to know the following facts. Having slightly winged a Jack (*Scolopax Gallinula*), I brought it home and placed it in a gauze-wire cage to prevent its injuring itself by attempts at escape ; I gave it worms, chopped raw beef, and a portion of boiled rice, on this it fed freely, and soon became perfectly tame—would take a worm from my hand and eat before strangers, requiring three good meals a day, the last late in the evening ; the mixture in the tin vessel, if not sufficiently soft, was rendered so by the addition of water which it took on its bill for that purpose ; the whole of the meat was eaten first, leaving a portion only of the rice in a thin pulp. It lived a month, and its death was occasioned by want of room to dry its plumage, which was always in a wet state, and the glutinous nature of the rice-water causing the sand and gravel to adhere to the breast-feathers ; this would be obviated by placing these birds in an aviary or room, with plenty of clean water and tufts of grass or reeds for their shelter. In this state the whole of the *Scolopax* tribe may be kept alive, and would be highly interesting to the ornithologist.—*W. F. L. Ross ; Topham, Devon.*

Notes on the partial migration and local shiftings of certain Birds in East Lothian, and a few Remarks on the subject in general, as applied to Scotland and the North of England. By ARCHIBALD HEPBURN, Esq.

IF any one was inclined to doubt the propriety of our worthy editor's remarks on 'Partial Migration' (Zool. 983), or to cavil at the approbation with which he quoted a passage from the writings of the intelligent Bewick, bearing upon the same subject, surely he ought to cast away all such misgiving after attentively perusing the excellent papers by MM. Duval-Jouve and Deby, on the birds of their respective countries. No one, I think, possessed of similar tastes with these two authors, can fail to express his surprise at the novelty of the facts adduced, and his delight at the fine field for research which is therein opened up to view. Leaving the further elucidation of *continental Ornithology* to these two naturalists, and trusting they will ere long receive the efficient aid of many able coadjutors amongst their respective countrymen, let each turn his thoughts homewards and with renewed earnestness of purpose, giving the most careful attention to the habits and distribution of the birds which occur in his daily walks, and strive to make good his right to those honorable titles which the short-sighted enemies of this method of study have heaped upon us by way of reproach. Thus only can we hope to amass a body of indestructible facts, prepared for the philosophic mind, from which it can draw correct conclusions, and thence rise to general laws. And let those who despise such labours give heed to this extract from the works of the immortal Cuvier. "The most simple observation may overthrow the most ingeniously constructed system, and open our eyes to a long train of discoveries, which had been previously concealed from view by received formulæ."

The following notes have been arranged in the hope that they may prove useful and interesting, and I trust that they form only one of a series of papers on this interesting subject from the pens of other and more able observers, that will shortly appear in the pages of this magazine.

Common Buzzard, *Buteo vulgaris*. Is by no means a very common bird throughout the year, but there is an annual influx of the species in September and October, but especially in the latter month.

Merlin, *Falco Æsalon*. I have been long of opinion that there is a

partial migration of this species, which is not so common during winter, and they are always most abundant for a short period in October.

Kestrel, *Falco Tinnunculus*. There is annually a very marked addition to the numbers of this bird towards the latter end of October, but they speedily depart, and I have seen several months elapse during some winters without seeing a single individual, and they are never so common as during the more agreeable seasons of the year.

Sparrow-hawk, *Accipiter fringillarius*. Are also more numerous for a short period in October. Now, though the influx of the above-mentioned birds is very apparent in autumn, yet the experience of the writer does not enable him to note any similar increase in spring; the migration or local shiftings of the kestrel is the most striking of any.

Jay, *Garrulus glandarius*. Is a permanent denizen of the noble woods of Tynningham, whence a few depart to spend the winter in the southern plantations of this parish, and chiefly in Presmenan wood in the adjoining parish of Stenton, where the oak, the beech, and the hazle abound.

Song-thrush, *Turdus musicus*. Departs annually about the end of October or beginning of November and returns early in February; two or three solitary individuals may be seen during winter, but I have ascertained from my friends, Thomas Durham Weir, Esq. of Boghead, West Lothian, and Mr. Jerdon in Roxburghshire, that this migration or shifting also takes place in their respective neighbourhoods.

Redbreast, *Erithaca Rubecula*. The greater proportion of this species departs in October, and returns in March; this is to me a new movement of which I had long entertained doubts, but these have been dispelled by facts.

Red Wagtail, *Motacilla Yarrelli*. Departs early in October, and returns in pairs in March; but to what mysterious cause are we to ascribe the fact of this being the only resident wagtail during winter in Mid-Lothian and Peeblesshire, whereas the gray or yellow wagtail (*Motacilla Boarula*), is the only winter resident belonging to this genus in East-Lothian.

Meadow Pipit, *Anthus pratensis*. Forsakes its chosen summer haunts, the Lammermoors, and the rocky untilled eminences, for the cultivated fields, till warned of the approach of winter, he takes his departure from the interior in October, and does not return to his summer haunts till March. Considerable numbers of these birds are found on the rough grassy knolls and sand-hills near the Firth of Forth in all seasons, but I feel assured that those haunting the interior in summer, remove to some other district.

Reed Bunting, *Emberiza Schœniclus*. Is partially migratory, the main body departs in October, and returns in March.

Skylark, *Alauda arvensis*. Departs from this and all the interior parishes of the county about the middle of December, and returns by the end of January or beginning of February, and shortly joins the vernal chorus of the song-thrush, chaffinch, and hedge-chanter; a few individuals will remain behind their fellows in the interior: whence the main body departs for so short a season can only be surmised. I have looked narrowly to the comparative numbers found on the sea-bound farms throughout the year, but I cannot state whether or not the exiles from the interior take up their residence there; I have some good grounds for believing that they depart for the milder regions of the south.

Golden Plover, *Charadrius pluvialis*. Comes down in large flocks in the cultivated fields from the Lammermoors in August and the two following months, very few haunt the hills throughout the year; they are by no means so numerous during midwinter as they are in March and April, when their presence and call-notes give additional charm to the season. I feel assured then that they are also migrants or shifters to a partial extent.

Lapwing, *Vanellus cristatus*. Departs from our cultivated fields late in October, and after lingering on our sea-coast for a short period the flocks depart, and we see no more of them till March, about the time that we sow field beans, when they once more haunt the sea-shore for a few days previous to dispersing over the country, but a late snow storm drives them back to the coast for food. I learn from the list of winter birds found in the Hebrides and in the neighbourhood of Edinburgh, as given in Professor Macgillivray's work, (vol. i.) "that this bird is a permanent resident in the Western Isles, and is common on the shores of the Firth of Forth, near Granton, and on the plains of Corstorphine, in the neighbourhood of the city."

Curlew, *Numenius arquata*. Leaves the Lammermoors in straggling parties early in August for the shores of the Firth; a few birds may spend a day or two in some pasture field in the interior when on their way to the coast, where they feed along the tide-way, and along shore, and in the neighbouring fields till the season of love recalls them to their summer haunts: this return movement takes place in April.

The above list is confessedly incomplete, especially as regards water birds. There are many difficulties attendant upon the study of their habits and distribution, however the result of the labours of the

two distinguished foreign contributors, will be an inducement to collect additional facts for comparison with such as I already possess. Since writing on the migration of the kestrel, I have noted the following passage at p. 334, v. iii. of 'Macgillivray's British Birds.' "I have not observed any deficiency in the number of kestrels in the district bordering on the shores of the Firth of Forth in winter, when, on the contrary, I think them more numerous than in summer. Probably, like the martin, this species merely migrates from the interior to the coast." Dr. Macgillivray, at the time when he wrote, resided in Edinburgh, and I look upon him as being a most excellent authority; yet the above statement only serves to render the cause which induces the kestrel to migrate from this county, and also from Walton Hall, still more obscure. Many a time have he and I talked over this and other matters relating to practical Ornithology, and I perfectly recollect that what I have stated about the wagtails was equally puzzling. I find that in his 'List of Birds to be found around Edinburgh in the winter season,' v. i. p. "the song-thrush is stated to be plentiful;" and when narrating the habits of the fieldfare, he states "that the irrigated meadows which occur in the neighbourhood of the city are the chosen resort of many thrushes during hard weather:" but I am quite prepared to prove that the vernal migration of song-thrushes in this county takes place from the south and not from the west.

It would be doing good service to Natural History were some outdoor naturalist, residing in Northumberland, Durham, or Yorkshire, to ascertain these points:—

1st. Are the above-mentioned rapacious birds migratory? Do they receive any addition to their numbers in October, taking particular notice of the kestrels which Mr. Waterton states to be migratory: they may only remove to the coast for a season and not cross the seas as Mr. Waterton asserts.

2nd. Is the song-thrush migratory? Are their numbers increased in the beginning of November? Do any of them depart about the end of January?

3rd. Which of the wagtails are resident in his district?

4th. Are the titlarks migratory from the interior to the coast? Do they receive many visitors from the north in autumn, and when do they depart?

5th. Apply the like queries to the reed bunting.

6th. Is there any great influx of skylarks in or after the middle of December, and any diminution of their number in February?

7th. Are the lapwings migratory? Do many arrive from the north in the beginning of winter and return thither in March?

8th. Is there ever any influx of golden plovers into the district?

I have carefully perused the many excellent 'Lists of Birds' which have appeared in this magazine with reference to the subject of migration, but I have not found much information of the kind. However, Mr. Briggs, Melbourne, Derbyshire (Zool. 657), has accurately pointed out the annual increase of the song-thrushes in November, and their departure in spring, but the Rev. G. Gordon (Zool. 506), states that this bird is a permanent resident in Morayshire, and according to Professor Macgillivray, they brave the severity of a Hebridean winter, haunting the shores, and feeding on *Turbo littoreus* and *Trochus conuloides*: they are migratory in Upper Lanarkshire, and from the same author I learn that the lapwing is also a permanent resident in the same stormy regions. I ought to have stated that *Motacilla Boarula*, though found here during winter, is by no means so abundant as at other seasons, there is a marked decrease in October, and an influx in March or April after the pied species appear. Mr. Briggs has a note on the partial migration of the skylark and pipit (Zool. 657), and I feel assured that this gentleman, whose polite attention to the inquiries of Mr. Jerdon regarding the song-thrush, has enabled me to give additional interest to this paper, will in like manner favour his fellow labourers with such notes on the subject under discussion as his journal affords.

ARCHIBALD HEPBURN.

Whittingham, Jan. 3rd, 1846.

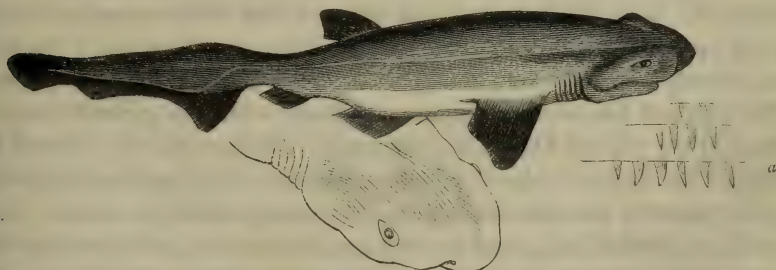
Remarks on a Tortoise.—Like White of Selborne, I too have my old tortoise, which has been an inmate of my garden upwards of thirteen years, and this day, March 4th, I find it breaking ground. One not so long resident was observed to have its head above ground a week since, or about the 26th of February; I see on referring to my notes that this is earlier than usual. The "box tortoise" from New York, on one occasion, came out the 1st of March, but a frost setting in killed it. The one now alluded to is *Testudo Græca*, which seldom leaves its retreat before the middle of April, it then refuses food for some time; a crushed snail, however, it can rarely resist. I think I have ascertained its yearly growth, as on its first appearance (if watched) it will be seen that a fresh line of bright yellow has been added to the shell at the junction of the marginal scales with those of the back, this seldom exceeds one-sixteenth of an inch. For a certain period this may indicate its age, by counting the striæ or furrows; but in very old specimens, the early markings become obliterated, and like old cows, whose rings on the horns are worn out, they also get out of mark.—*W. F. L. Ross; Topsham, Devon.*

NATURALIST'S CALENDAR FOR MAY.

BIRDS.—The spotted flycatcher (*Muscicapa grisola*) and the goatsucker (*Caprimulgus Europæus*) arrive in the first week of this month. Most of the terns also reach us about the same time, and resort to their breeding stations on various parts of the coast. The Sandwich tern (*Sterna Cantiaca*), and Arctic tern (*Sterna arctica*) breed in great numbers on the Fern Islands, off the Northumbrian coast, where also the roseate tern (*Sterna Dougalli*) is not uncommon, and a few of the common tern (*Sterna Hirundo*) may also be met with, but this last species is far more numerous on the southern coast of England. The winter birds have now mostly left us, but a few of the waders still linger on our shores, and specimens of the gray plover (*Squatarola Helvetica*) may be procured in full summer plumage, particularly on the eastern coast.

INSECTS.—The swallow-tailed butterfly (*Papilio Machaon*) makes its appearance about the middle of this month, and continues to come forth till the middle of September; the larvæ feed on the milk parsley (*Selinum palustre*), and are very common in the fens of Cambridgeshire and Huntingdonshire. The chequered skipper (*Steropes Paniscus*) is very abundant in Monk's Wood, Hunts, and in many of the woods in Northamptonshire, and is usually on the wing about the 15th. The fritillaries (*Argynnis Euphrosyne* and *A. Selene*) are very common in almost every wood, and the marsh fritillary (*Melitæa Artemis*), an extremely local species, but abundant where found, is now out. The beautiful clear-winged sphinges (*Sesia Bombyliiformis* and *Fuciiformis*) may be seen hovering over the flowers of the bugle and harebell, and many *Geometræ* may be found resting upon the trunks of trees, particularly the ingrailed moths (*Tephrosia crepuscularia*, *consonaria*), &c.—*Henry Doubleday; Naturalist's Almanack for 1845.*

*Account of the capture, in Cornwall, of the Six-branchial or Gray Shark; but lately recognized in the British Fauna. By JONATHAN COUCH, Esq., F.L.S., &c.**



The *Notidanus griseus*, *J. Couch.* a. Teeth.

On the 19th of February of the present year (1846) there was caught by a fisherman of Polperro, and immediately brought to me, a speci-

* Read before the Natural History Society of Penzance.

men of a fish, which I recognized as the Six-branchial, or Gray Shark : a species new to the Fauna of Cornwall, and until lately, to Britain. Beside the advantage of making a record of the occurrence of every novelty in Natural History, as neither any precise description of this species, nor a figure, is to be found in any work that is easily accessible, I have much pleasure in communicating the particulars derived from this capture, together with a drawing, to the Natural History Society of Penzance. The length of this specimen was 2 feet, $2\frac{1}{2}$ inches; the head wide, and level over the summit; the breadth, from eye to eye, $2\frac{3}{4}$ inches; the snout rounded in front, and somewhat thick; eye large, staring, and slightly oval; without an angle on the anterior portion, or inner canthus, and destitute of a nictitant membrane. This portion of the eye is immediately over the symphysis of the lower jaw. The larger nostril is half way between the eye and snout, enclosed by a prominent margin, the orifice directed forward. Temporal orifice small, $1\frac{1}{2}$ inch from the posterior angle of the eye. The gape very large; tongue bound down, and not apparent; teeth, in the upper-jaw eight on each side, thin at the base, the points slender and sharp, not serrated, their direction towards the angle of the mouth. A small vacancy at the symphysis of this jaw; and a little in advance of this are four teeth, the two middle ones being very slender and parallel, the points directed towards the mouth; the other two more remote, and their points diverging. A little in advance of these are other two, that might easily escape observation, slender, smaller, and more loosely attached. As in the upper jaw, so in the lower, there is a single row of teeth, but they differ greatly in form, being thin and broad, their anterior margin higher, the sloping edge finely serrated; they are six in number on each side of the symphysis, with what appears like a small bifid intermediate one. Orifices of the gills six, closely approximate; the apertures long and encircling the throat. The pectoral fins wide, triangular. Body with the general proportions of the Picked Dog-fish; the head wider and larger. Dorsal fin single, its anterior edge 14 inches from the snout, and opposite the space between the ventrals and anal, it is larger than the latter. Caudal fin $6\frac{1}{2}$ inches long, and consequently more than one-fourth of the length of the fish, and longer as well as more slender than that of any other British shark, except *Squalus Vulpes*. The inferior lobe of this fin is falcate, and becoming attenuated as it proceeds; being narrowest opposite the notch. Along the posterior two-thirds of the upper margin of the tail, is a row of spines, of three series, closely pressed together at the roots, and the two outmost regularly diverging. Tex-

ture of the skin rough, when felt against the grain. Colour blackish brown on the back, and pectoral, dorsal, and caudal fins; reddish gray on the sides, white beneath. Lateral line pale, bent suddenly down at the falcate portion of the tail. Conjunctiva of the eye bluish white, the pupil large and black. A male; the claspers small. It was taken with a line, at the distance of about three miles from land; and seemed at the time to be feeding on pilchards.

This species appears to have been unknown to the older naturalists, since I have sought for it in vain in the works of Rondeletius, Gesner, Ray, and Ruysch; and it is not included in the tenth edition of Linnæus's System of Nature, though it is recognized in Turton's translation of Gmelin's edition of the same work, under the name of *Squalus griseus*. It is there represented as growing to the length of $2\frac{1}{2}$ feet; but though this differs so little from the size of the Cornish specimen, it is clear, from the additional teeth specified by Turton, that the latter must be decidedly a younger individual. A specimen, the first, and only other that has been taken in Britain, was caught with a line, off Ventnor, in the Isle of Wight, in November of last year; which measured little less than 11 feet in length; and Risso (Ichthyologie de Nice) describes the fish in terms which can signify nothing less than these full proportions. In the specimen referred to by Turton, there was only one row of teeth in the upper jaw, but there were "many rows" in the lower; and therefore we may judge that it is about this period of its growth that the evolution of dentition begins to show itself, and first in the lower jaw. I could discern no more than one row in each jaw, in the specimen I have described. Risso assigns three rows of triangular sharp-pointed teeth to the upper jaw, and to the lower five; and he adds, that the central inferior teeth are sharp and conical; by which I understand him to say, that at the symphysis, between the lateral arrangements of flat serrated teeth, he made out two or more of what I had supposed to be a single bifid tooth. It is probable he is correct; but they are pressed closely together, and erect; so that in my specimen their true nature could not have been ascertained without some degree of mutilation. By Rafinesque, and subsequently by Muller and Henlé, this species has been constituted the type of a separate genus, under the name of *Hexanchus*: one of the chief marks of which is, that contrary to by far the largest number of the family of sharks, it is furnished with six branchial orifices, and of which genus it is the only known species.

By Cuvier it is named *Notidanus*; and he classes in the same

genus a couple of others, that are marked by the occurrence of seven branchial orifices ; on which account the latter have been formed into the genus *Heptanchus* by the two above-named German naturalists. It is more easy to raise objections to any proposed arrangement of this family of fishes, than to form a new one ; and at least a more extensive acquaintance with the species must be obtained, before a classification can be made that will stand the test of close inquiry, as a natural series. Cuvier has remarked, that though the teeth of this fish have been well figured, the fish itself is nowhere well represented. But he is wanting in his usual accuracy when he adds, that it differs from *Galeus* only in the absence of the first dorsal fin ; for beside the greater width of the head, which is a sign of less activity ; and the different form of the teeth, that leads to a different mode of feeding ; the much superior length of the tail, and the singular ridge or spines along its superior margin, which must be employed in a different mode of defence, and which assimilates it to the Black-mouthed Dogfish (*Scyllium Melanostomum*), are quite sufficient to show it widely distinct. In this last particular, indeed, it approaches the genus *Pristiurus* of Muller and Henlé, while its snout bears an intermediate character between it and the genus *Scyllium* ; so that it is equally allied, and yet equally distinct from either of them. In its habits it is undoubtedly a ground shark ; and Risso says that it keeps in very deep water in the Mediterranean, in some parts of which it is said to be not uncommon, though Swainson never met with it during six years that he resided in Sicily. The ground sharks, with us, are very inactive ; and the fisherman who caught this fish informed me, that it scarcely moved after it was taken into the boat.

JONATHAN COUCH.

Curious mode of fishing in India.—I have never seen the following Indian mode of fishing noticed in any work. It is practised about Midnapour in Bengal, where I resided for some time and constantly partook of its fruit. It is at least a good illustration of native patience. The spear consists of from eight to ten pieces of very light reed, about a finger in thickness, each piece from four to five feet long. These joints fit neatly into one another (like a fishing rod), the ends being bound with thin strips of cane to prevent their splitting. The last joint carries a light iron, and is barbed double, and the whole tapering from the butt to the point. The fisherman stands on the bank of the stream, and having fixed a piece of red flannel or cloth on the barbs, deliberately pushes out the spear into the stream at right angles to the bank, adding joint to joint until he reaches a length of from thirty to forty feet. He then, perhaps, feels he has a fish, and slowly takes it to pieces, until he has landed his captive,—generally a kind

of fish somewhat like a whiting, and weighing about half a pound. I was much surprised, and asked him *how* the fish were caught? He said, "that owing to the spear floating and the motion of the stream, the fish took the red flannel to be a frog, and so jumped, whilst the forward motion of the spear transfixed them. I may remark that all that I saw were pierced through the body immediately below the back-fin.—*C. Horne; Clapham Common, March 19th, 1846.*

Trolling extraordinary.—Dr. Fielding, of Lenham Lodge, Kent, last month, caught in three hours' trolling four fine pike. The largest measured three feet three inches in length, and weighed fifteen pounds; the second weighed nine pounds, the third four pounds and a half, and the fourth three pounds and a half. In addition to these he lost three heavy fish; one by the breaking of the swivel, the second by the giving way of the wrapping close to the hook, and the third by the hook tearing away from its hold.—*Globe, April 7th, 1846.*

The Toad Fish of New South Wales.—A disgusting tenant of most of the shores around Sydney, is the toad-fish: most admirably named; it looks precisely like a toad elongated into a fish, with a tough, leathery, scaleless skin, and a bloated body, dark mottled brown above, and white beneath. It is usually about five inches long, and disproportionately broad, but swims very swiftly, and is for its size, as bold and voracious as the shark. When I said Mr. Meredith *did* not fish with the rod, I might have added that he could not, for the toad-fish, which swarm everywhere, no sooner see anything dropped in the water, than they dart towards it by dozens, and fight among themselves for the honour of swallowing your hook, generally taking the precaution to bite off your line at the same time. This extreme anxiety to be caught might perhaps be pardoned, were the greedy little wretches fit to eat, but they are highly poisonous; and although I should have thought their disgusting appearance sufficient to prevent their being tried, I know one instance at least, of their fatal effects; a lady with whose family I am intimate having died in consequence of eating them. As they thus effectually put a stop to our angling by biting off every hook dropped in the water before any other fish had time to look at it, they especially enjoyed the benefit of the fishing spear, upon which many hundreds, if not thousands, must have been impaled in succession. This sounds very wantonly cruel, but let no one pronounce it so, who is not well acquainted with the toad-fish; from those who are, I fear no reproof. When speared, they directly inflate their leathery skins like a balloon, and eject a stream of liquid from their mouths, with a report as if they had burst. If flung again into the water, however wounded, they instantly swim about and begin eating; and should one be a little less active than his fellows, they forthwith attack and eat him up. Even my poor little harmless friends, the crabs, become their victims; when those usually well-armed troops have just got their soft new coats on, and are almost defenceless, then come the cowardly, ravenous toad-fish, and make terrible onslaughts among them, an attention which I believe the crabs eventually repay with interest.—*Mrs. Meredith's Notes of New South Wales, p. 155.*

Flowers attractive to Moths.—In addition to Mr. Gaze's list (Zool. 1088), I have found the following flowers and shrubs attractive to moths, viz., the French and African marygolds, the white verbena (*Verbena teucrioides*), sweet scabious, all the thistles, the common laurel, privet, holly-leaved berberry, common berberry, and the mistletoe;

I have a fine bush of this plant, growing on an apple-tree, and have found a great many moths at it this spring: I never thought of examining it before. The holly, when in flower, will I think, prove attractive, but unfortunately I have none here to examine. The Portugal laurel is very strongly scented, but I have found but few moths at it, though it may be more attractive elsewhere. I have no doubt that many more shrubs, &c. attract moths, and I shall be glad to see them noticed in the 'Zoologist.' The golden rod and the Michaelmas daisies attract vast quantities of Hymenoptera and Diptera in the autumn, but I have never seen any Lepidoptera at them except one or two butterflies.—*F. Bond; Kingsbury, Middlesex.*

On the treatment of Insects when captured.—In the last 'Zoologist' (Zool. 1240) is a note on the treatment of Coleoptera when captured. The article is evidently dictated by the purest feelings of humanity, but you must admit that it charges entomologists (at least indirectly) with wanton cruelty, a charge against which I will endeavour to defend them. When I first became a collector, the apparent sufferings of my captives for a time deterred me from the pursuit; but afterwards I determined to try if I could ascertain whether the struggles of insects did really proceed from pain; and the conclusion at which I arrived was, that they do not. As, however, the mere assertion of an opinion without anything to support it, may appear dogmatical, I will state the method I pursued. Finding a *Noctua* during the day at rest on a tree, I pierced it with a pin without its showing any signs of animation; this surprised me, and I fixed it in a box where it remained motionless until the evening (the time it would have been on the wing), then it struggled very much, but surely not in agony, but only to effect its escape; for if the struggles were the result of its being impaled, would they not have taken place sooner? I next caught a butterfly and pierced it in like manner, and I admit it struggled to the utmost; but again, I think, not in agony, but only to extricate itself that it might enjoy its mid-day flight; for in the evening it became perfectly still and exhibited no signs of suffering. These insects I kept impaled several days, and I invariably found that the former was still and the latter restless during the day, and the reverse at night. Am I not then justified in concluding that struggling is not the result of agony, but merely an effort to escape from imprisonment that the insects may rove at their appointed time? I infer too, from these and similar experiments, that what we call pain is felt by insects in a very small degree; for I think it will be admitted that pain is destructive of life, but insects will live almost as long when impaled as when they are at large; and even this difference may possibly arise from some chemical action of their juices (for want of a better word) on the pin. This is the case of Lepidoptera; that of Coleoptera is different, for during summer most of them appear at all times active, and therefore impale them when you may, they will struggle, but I think not in agony; if it were so, their very sufferings would soon destroy them, whereas I have found them revive after having been impaled for two days, and exposed all the time to an atmosphere strongly impregnated with camphor and spirits of turpentine. With all deference to Mr. Dawson, I must be allowed to doubt whether the sufferings of the impaled Coleoptera were greater than they would have been if exposed to a camphorated atmosphere to undergo the process of stupefaction: but I fully acquiesce in his method of ultimately destroying them, and consider his plan of plunging the bottle into boiling water preferable to immersing the insects: the colours will be less injured, and life almost as soon extinguished. I seldom collect Coleoptera, but do so occasionally. The method I adopt is different from either of those mentioned by Mr. Dawson; and as it cannot well be taxed with cruelty, and has

hitherto been attended with success, I will just name it. In the lid of a tin, of about three pints capacity, I have a tube inserted by which to introduce the insects; this tin I partly fill with light earth mixed with decayed leaves or rotten wood, in order to prevent the different kinds from coming into contact, or if they do, to afford them a ready retreat. Since I adopted this plan I do not remember that any mutilations have occurred. What I have stated is the result of experiments made merely to satisfy my own mind; but they may, perhaps, in some degree exonerate collectors from the charge of cruelty, though I despair of their being fully acquitted.—*William Turner; Uppingham, February 18th, 1846.*

On killing and relaxing Insects.—Much has been written about the power of feeling in insects, and every collector must have had under his notice many instances showing that it is very obtuse. Dr. Badham has indeed lately published a book,* to prove that they do not feel at all, and if we could believe *that*, there would at once be an end of compunction for the pain which we in some instances appear to inflict upon them. But as there will still be some sceptics (among whom I confess I am), it is not unworthy of our consideration in what manner we can kill them most quickly, and at the same time without injury. The plan recommended by the Rev. Mr. Dawson (Zool. 1240), I thought was generally used; I did not think that any one was so *green* as to impale beetles alive. But though bottles will do to put beetles into, they will not serve for moths, Hymenoptera, &c. Nearly all the small moths may be taken home in pill-boxes, one in each box, and killed by the fumes of sulphur, several boxes being operated on at once by placing them in an inverted glass or other vessel. The larger species of moths, bees, &c. may be taken in the same way, pinned, and instantly killed by piercing the under-side of the thorax with a quill dipped in a solution of oxalic acid. This poison is also speedily fatal to dragon-flies, which, perhaps, are more tenacious of life than any other insect. It is, however, sometimes necessary to pin small moths in the field; in such cases a piece of camphor secured at the corner of the box soon stupefies them, but they are apt to become rigid and give a deal of trouble in setting, having generally to be relaxed by damp. Another method of doing this has lately been discovered (by Mr. Thwaites I believe), and as it has several advantages over the old plan, I wish to make it known. A quantity of laurel-leaves (thirty or forty) is much bruised, put into a bag, and enclosed in an air-tight vessel; on the bag are placed the insects wished to be relaxed, and they become flexible in a few hours, more or less, according to their size. The advantages of this system, are that insects may be left for any length of time without getting mouldy, and that moths of a green colour or delicate texture may be operated upon without injury, none of which were possible on the old plan. It is somewhat singular that this relaxing effect should be produced by laurel-leaves, which contain a large amount of prussic acid, because if an insect be killed by that poison, its membranes become intensely rigid.—*J. W. Douglas; 6, Grenville Terrace, Coburg Road, Kent Road, Feb. 7th, 1846.*

On an admirable method of relaxing Insects.—Through the kindness of Mr. Dale, I have been informed of a most excellent method of relaxing Lepidoptera and other insects, and having adopted it lately, and finding it answer uncommonly well, I think it will be a great benefit to entomologists to make the plan generally known. I procure about a dozen shoots with the leaves of the common laurel, the younger the better, put them into a coarse bag or cloth, (shot-bag I use) bruise them well with a wooden mal-

* 'Insect Life.' Blackwood, Edinburgh and London.

let till the bag becomes quite moist, then put it into a jar or other wide-mouthed glazed vessel, and stick the insects on the top of the bag, which must be tied over with a bladder or secured in some way so that it is perfectly air-tight. Twenty-four hours are generally sufficient to relax most insects, but one great advantage is, that if they remain a week or ten days in the laurel they are not in the least injured, so that they can be set out at any convenient opportunity, it also completely destroys the mites or mould if the specimens happen to be infested, and it will be found to have many very great advantages over the old plan of damp sand or flannel. I was in hopes, from experiments that I made on two or three green species, that the colours would not fly, but I since regret to find on further trial, that *Hipparchus papilionarius*, *Hemethea vernaria* and *Cythisaria*, are considerably changed by it. Mr. Dale informs me it answers equally well with the other orders, he having relaxed nearly the whole of his dragon-flies; and it is much used at Bristol for the Hymenoptera. It also effectually relaxes the skins of birds, and kills the vermin much better than camphor. It is a very curious fact that laurel should have the effect of relaxing insects, as it causes them to become rigid at first when killed by this means.—*Samuel Stevens*; 38, *King Street, Covent Garden, March 5th, 1846.*

On the treatment of Insects when captured.—All persons of, not feeling merely, but, reflection, must coincide with Mr. Dawson's remarks (Zool. 1240), on the *duty* (I will say, though that is not Mr. D.'s expression), of not giving unnecessary pain to the creatures, particularly insects, which may be captured for specimens. Being no entomologist, I have been reluctant to interfere in a matter which I do not understand, but have been rather surprised to observe no notice of a method of killing insects, which I have known to be practised with very considerable success. It was, to have a tin box (or boxes rather, as different sizes should be employed) made in two compartments, the lower having a perforated top (of course moveable); which lower division would be supplied, when required for use, with a quantity of common smelling salts, and the insects confined in the upper division, immediately over, but separated from the ammonia, the fumes of which rapidly prove fatal. Being at a distance from the parties who adopted this plan, I am writing entirely from recollection, after an interval of fifteen years and upwards; however, I am confident the operation generally was very successful, though I believe that sometimes very delicate colours were injured by the process, and that occasionally it was very difficult, if not impossible, to kill the larger insects, such as the great moths, in which case they suffered much, besides beating themselves into a very useless condition as specimens. Certainly it must be indispensable to renew the composition continually, and I conceive it might be advisable to line the upper part of the box with cloth or something soft, providing against intercepting the free circulation of the fume from the ammonia.—*A. Hussey*; *Rottingdean, February, 1846.*

Endromis Versicolora.—A few days since I bred a fine male of this rare moth, which I received in the chrysalis state from Worcestershire about fifteen months since; I made sure it was dead, as some of my friends bred the insect twelve months since, from the same brood of caterpillars which they procured at the same time as mine: it had been about three months in chrysalis when I received it. I had five others, but I regret to say they are dead.—*Samuel Stevens*; *King Street, Covent Garden, March 5th, 1846.*

NATURALIST'S CALENDAR FOR JUNE.

BIRDS.—At this period of the year there is but little to notice among the birds: most species are engaged in rearing their young, but occasionally a few of the winter visitors remain on our coast up to this time, such as sanderlings, knots, &c., and of course in full nuptial dress; but they soon leave for their breeding stations in more northern latitudes. Most of the warblers are silent towards the end of the month, and but few of them sing much after the young are hatched.

INSECTS.—In this month a very great variety of insects are to be met with. The larger fritillary butterflies (*Argynnis Paphia*, *Adippe* and *Aglaia*) appear; the two former frequenting woods, the latter preferring heaths and open places. The local *Melitæa Athalia* is abundant in some of the woods round Colchester, where the white admiral (*Limenitis Camilla*) also abounds. The elegant little blue butterflies (*Polyommatus Alexis*, *Ægon*, and *Adonis*) may be seen abundantly in fields and heathy places, the latter species principally on a chalky soil. The burnet moths (*Zygæna Trifolii*, *Filipendulæ*, and *Loniceræ*) come forth during this month. The first species at the beginning, the second towards the middle, and the third at the end of the month. This last species is more local than the others, but is abundant in some parts of Huntingdonshire, and is to be found till the end of July. The rare lobster moth (*Stauropus Fagi*) is sometimes to be met with resting upon the trunks of trees, and many *Noctuæ* may be found in similar situations. A large portion of the dragon flies are now on the wing; the beautiful blue-winged species (*Calepteryx Virgo* and *Ludovica*) are common over streams, and *Anax formosa*, the largest European species may be seen sailing over large ponds, where also *Cordulia cenea*, *Libellula depressa*, *quadrimaculata*, *cancellata*, &c., and many of the smaller species (*Agrion*) are to be found. At this time numerous caterpillars of Lepidoptera may be found by beating the oaks and hornbeams over a sheet or net, and other species concealed in the crevices of the bark, such as those of *Chariptera Aprilina*, and the December moth (*Pacilophasia Populi*).—Henry Doubleday; *Naturalist's Almanack for 1845*.

Capture of Acherontia Atropos at the Land's End.—On the 18th instant I had brought to me a very fine *Acherontia Atropos*; it flew into a house, and the people did not know what it was. I have added it to my collection. I think, by the freshness of the insect, it must have just emerged from the pupa. I should like to know whether any collectors have taken it at this season of the year.—W. Noye; *St. Just, near Penwith, April 28th, 1846*.

Capture of Deilephila lineata, Fab. (*Livornica*, Esp.)—A male specimen of this rare Sphinx was brought to me alive yesterday afternoon by a boy, who found it in removing the straw which is covered nightly over the new-made bricks in a field near my house at Hammersmith; he says there was another specimen precisely like it, (probably the female) but before he could secure it, it flew away: unfortunately it is in very bad condition, having been covered over with a sieve the whole of the day, it had rubbed itself very much in endeavouring to escape. I think the early specimen of this rare Sphinx forebodes an extraordinary season—also an abundant one, judging from the

number of larvæ which may now be met with feeding at night.—*S. Stevens* ; 38, *King Street, Covent Garden, April 17th, 1846.*

Capture of another specimen of Deilephila lineata at Hammersmith.—On my return from town yesterday I found another example of this rare *Sphinx* waiting my arrival; it had been taken that morning amongst some strawberry plants, within a couple of hundred yards of my own house, and about the same distance from where the specimen taken a fortnight since was found, this being the female, it is quite possible it may be the specimen that flew away when the boy captured the male: this is fortunately in fair condition. Mr. Dale informs me, by letter, one was taken by a gentleman at Langport on the 18th, and another at Bristol on the 20th of last month.—*S. Stevens* ; 38, *King Street, Covent Garden.*

Capture of Deilephila Celerio (Linn.) at Manchester.—In September, 1844, William Jamieson, an intelligent collector, captured two full-grown caterpillars resting on grass, by the side of an old pit near Newton Heath, in which *Equisetum palustre*, was the predominant plant. He placed them along with other caterpillars in his breeding box, soon afterwards they escaped, from the insecure state of the box, and no hope was entertained of ever seeing the imago; however, on the 6th inst. his wife observed a large moth flying at dusk before the house, situate in a populous part of the town; on the 9th a beautiful female specimen of *Deilephila Celerio* was taken resting on the window-ledge of the adjoining house, which I had the pleasure of setting and adding to my collection. I possess another specimen, taken in the same district as the above caterpillars in 1838. On showing Jamieson, Westwood and Humphrey's plate of the genus *Deilephila*, he recognized the caterpillars, and remarked there were three or four blue eyelets on each side, not so near the head as represented in the plate, nor did the caterpillars appear so large: I have no doubt they found a suitable place for changing to the chrysalis, in an old brick wall full of crevices and close by his own door. Boisduval observes on this genus, "*Puppa nuda, cylindrico-conica, humo vel quisquilis sepulta,*" and from the observations of other entomologists, they are exceedingly variable in the time of their appearance, from three weeks to two years.—*Robert J. Edleston, Cheetham, April 28th, 1846.*

On the length of time taken by Sphinx Ligustri in the change from the larva to the pupa state.—Perhaps it will be of interest to learn the following occurrence with the chrysalis of a *Sphinx Ligustri*, of which I found the caterpillar in the latter end of October, yet very little, perhaps five or six days old; I took it home and fed it till the first days of November, and had hard work to get enough food, as by some nights' frost, a good deal of the vegetation was destroyed. The 3rd of November it went into the earth to change, and yesterday when I would take it out, it was about half-changed and still in the process of doing so; this morning it had reached its perfection: it is a well formed chrysalis, only the wings seem to become a little smaller than usual; so it has stopped under the earth for changing fifteen days, which is an occurrence never known to me, as in general the changing takes place in four or six days.—*A. S. Lamek* ; *Wandsbeck, November 19th, 1845.*

Power of instinct in the Male Oak-egger Moth.—On the 8th of August, 1845, a male specimen of *Lasiocampa quereus* visited my room for two successive days at various periods, when the open window allowed it ingress, it was at length taken. I observed a second in the garden at noon day, making a straight course for the house, on returning to my study and opening the window it immediately entered; it then struck me that some extraordinary cause must have induced its unusual visit. On examining

my breeding cage, I perceived a female recently excluded, the male instantly rushed into the compartment heedless of my being close to it. During the day six males were eventually captured. Instinct in this instance must indeed be all-powerful, as the males could never have seen the females or even the cage, which was in a dark part of the room and many things placed upon it. It would almost appear as if the first had given intimation to the others, so many congregating near the house in mid-day. It may not be generally known, that on applying the empty cocoon of this moth to the blue flame of a candle, it first burns to a white ash, and then becomes equal in intensity to the "Bude light"—a brilliant phosphoric white of dazzling brightness. I have never tried the cases of any other of the Lepidoptera. What causes this?—*F. W. L. Ross ; Topsham, Devon.*

Habitat of Gortyna Petasitidis.—This moth, apparently unknown on the continent, and rare in this district, I am convinced might be found by collectors elsewhere, provided attention be paid to the plant on which they appear to be so exceedingly partial, and from whence the specific name is derived, *Tussilago Petasites* in the neighbourhood of Failsworth grows in great luxuriance on the banks of a rivulet; the moths appear in August and are captured on the wing at dusk, and occasionally taken during the daytime resting on the leaves of the plant. Mr. Jobson met with it last year in Scotland in a similar locality.—*Robert J. Edleston ; Cheetham, April 28th, 1846.*

Capture of Orthosia leucographa (Hub.)—Mr. Bond and myself took eleven specimens of this rare *Noctua* from off the blossoms of the willows, between Ockley and Leith Hill in Surrey on the evenings of the 14th, 15th, and 16th of last month, just five weeks earlier than we took it last year.—*S. Stevens ; 38, King Street, Covent Garden.*

Note on Graphiphora tristigma (Ochs.)—I fortunately possess a specimen of this distinct species, the true *Graphiphora tristigma* of the continent, which I have had in my cabinet the last two years, and supposed it only an extraordinary variety of *triangulum*, which it much resembles; but it differs principally from that insect by the wings being longer, the under-wing very much paler, the colour over the entire insect much lighter, more of a chestnut hue, besides the markings on the superior wings being placed rather different, it agrees precisely with a foreign specimen of *tristigma* which Mr. H. Doubleday has received from M. Pierrot. I bred it from a larva I found feeding on the willows, I believe at Weybridge in Surrey, in the spring. The *graphiphora tristigma* of some of the old cabinets is now found to be the *rhomboidea* (Ochs.)—*S. Stevens ; 38, King Street, Covent Garden.*

Capture of Cleora, or Ephya pictaria.—I took three specimens, all females, of this rare *Geometra* on the palings on Dartford Heath, the first on the 11th inst., the two others the following day, all in good condition.—*S. Stevens ; 38, King Street, Covent Garden.*

Larva of Graphiphora cataleuca (Reginera, Steph.)—I have again succeeded in taking the larva of this local insect; and not finding it described in any work which I have seen, I subjoin the accompanying figure and description. When full-grown, it is about an inch and a half in length; the general colour greenish, or grayish black, suffused in some individuals with a faint purplish bloom; along the back are two rows of whitish or yellowish spots, each spot bounded anteriorly by a darker shade of black. These maculæ become indistinct towards the head, and disappear entirely on the third segment; they are much more fully developed in some individuals than in others; the general colour is also variable. I have selected one of the most strongly marked

for my figure. I found these larvæ in stony spots on the open hill-side, generally lurking among the grass at the side of the stones when raised, and sometimes sunning themselves on the outside of the stones themselves. When thus exposed, their colour assimilates very closely to that of the gray whinstone, and must be a great protection against insectivorous birds. They feed on various grasses, but will not refuse chickweed, spinach, &c., although nothing of the kind is to be found in their native locality.—*R. F. Logan*; *Hawthorn Brae, Duddingstone, March 28th, 1846.*

Miana Strigilis and *Æthiops*.—In the December No. (Zool. 1199) I was much surprised to see stated by Mr. Harding, amongst other places in which strigilis had not occurred, was that of Hammersmith. I cannot conceive on whose authority he could record that, as it is far from uncommon in the marshes as well as in my own garden; and I find from enquiries amongst my friends who visit the former locality, that most of their collections are supplied by specimens obtained there, *Æthiops* is exceedingly abundant and beautiful, intermediate varieties frequently occur. I have been informed also that strigilis is taken in Battersea fields. I quite agree with Mr. Doubleday, in thinking that there is but one species; I have always found that both insects appear simultaneously.—*S. Stevens*; 38, *King Street, Covent Garden, Dec. 22nd, 1845.*

Pterophorus tridactylus, captured on the 25th of February.—Whilst capturing moths on the 25th of February last, I beat from a box-tree a specimen of *Pterophorus tridactylus*, which in Mr. Westwood's 'British Moths,' is described as appearing in June. Could you or any of your readers inform me whether this species hibernates, if so, I should esteem a favour. I may add, the insect was not in the least rubbed or otherwise injured.—*W. Hambrough*; *Dunton, Bucks, March 26th, 1845.*

Capture of Lepidopterous Insects at Hammersmith.—In the 'Entomologist' (Entom. 397), I recorded the capture of some rare moths in the marshes (Little Whittlesea, as it has been aptly called); since that time a few other species have occurred which are probably worth noticing in your pages, I also wish to make some additional remarks on those previously noticed.

Leucania obsoleta. This species, which was formerly so rare in cabinets, may be taken at sugar and on the wing early in June till the end of July; the larva may be procured in the months of September and October feeding at night on the leaves of the reed; it is very difficult to breed, as it lives through the winter, and may be found laying torpid in hollow reeds: it changes early in the spring without feeding, to a chrysalis.

Leucania straminea, Treits (*Vectis*, Curtis). Is taken at sugar and on the wing, from the end of June until early in August; the larvæ, which are very delicately marked, may be procured young in October, but are best taken feeding at night on the young leaves of the reeds the following May; they remain about three weeks in pupæ, and spin a slight web for themselves generally between the leaves.

Leucania or *Nonagria geminipuncta*, Haw. (*paludicola*, Hub.) This also is taken at sugar in the month of August; the larvæ feed in the interior of the stems of the reed, and previously to changing into pupæ they eat away a hole nearly through the stem sufficiently large for themselves to escape when arrived at maturity, leaving only a very thin film over to protect themselves from the wet. The larvæ are full-fed in July.

Nonagria crassicornis. This has been very abundant the last two seasons, and varies greatly, both in size and colour; it makes its appearance the end of August, and I have taken it till December, but the best month is October, and a warm, windy night

the most favourable, they rarely come to the sugar, but are generally taken at rest between the hours of eight and ten o'clock, either on the blossoms of the reed, or on the stems close to the ground; the larvæ may be found in the roots of the reed in June and July, full-fed.

Nonagria or *Leucania pygmina*. September, scarce.

Nonagria Typhæ. Is also found in August to September, generally at rest, and at the same time in the evening as the former species, and when the bull-rushes abound.

Melia sericea. Taken in June and July, but rare, the males generally on the wing; this is evidently a reed feeder.

Chilo phragmitellus and *gigantellus*. I have little doubt but that the latter is the female of the former; it is much rarer to procure, but that probably arises on account of it seldom flying. I hope to take them paired some day; taken from June till September.

Nudaria senex. May be taken in June on fine, warm nights; it flies early and close to the ground, and was rare the last season.

Apamea ophiogramma. A few specimens have occurred in July and early in August, at the sugar; it seems rare.

Pæcilochroma piceana. August till October, tolerably abundant and variable. Semifuscana, I consider but a rare variety of it, about a dozen specimens of the latter have occurred to my knowledge within the last four seasons.

Phibalapteryx lignata. Taken in June and again in August, two broods, and generally tolerably abundant.

Abrostola triplasia. September, at sugar, but rare, also in my own garden.

Hadena or *Dianthæcia, capsicola* and *Cucubali*. I have taken both these species, at sugar, in July, but rare.

Polia flavocincta. Taken in my own garden, at sugar, but rare, September.

Agrotis Corticea. July, at sugar, but rare.

Agrotis exclamationis. July, several good varieties, with the characteristic marks on the superior wings, more or less confluent.

Agrotis puta. June and August, common, at sugar.

Apamea fibrosa. July, generally in tolerable plenty at the sugar, very variable.

Spilosoma papyratia. I hear one specimen has been taken.

Grammesia trilinea and *bilinea*. Both occur and at the same time, occasionally intermediate varieties; surely they must be one species?

Geometra Tiliaria. August, rare.

Lozotenia costana. June, common.

Cochylis roseana. July, local.

Depressaria curvipunctosa. June.

Depressaria ocellata. June and September.

Cleodora rufescens. July, rare.

Eudorea pallida. July, not rare.

Hydrocampa stratiotata. July, rare.

Sphinx Convoluti. I have two examples taken here, both in September.

Zeuzera Æsculi. July, 1844, one specimen found on the gravel walk in my garden, injured.

Agrotis suffusa. Not uncommon at sugar. Autumns of 1843—44, not seen last season.

Stauropus Fagi. See 'Zoologist' (Zool. 1043).

The following have occurred in my own garden :—

Anacampsis albimaculea. Fruit trees, June.

Anacampsis Listerella. Flowers of valerian, June, rare.

Anacampsis tremella. Apple trees, June, rare.

Oxyptate Gelatella. One specimen taken on Christmas eve, 1843, in the parlour.

Telea leucatella. Trunks of fruit trees, July.

Crambus falsellus. One specimen, August last, on door.

Lampronia corticella. Fruit trees, June.—*S. Stevens*; 38, *King Street, Covent Garden*, January 14th, 1846.

Capture of Lepidopterous Insects at Arundel, Sussex.—In the 'Entomologist' (Entom. 223), I recorded the capture of some rare Coleoptera in the neighbourhood of Arundel. I now send a list of the Lepidoptera which have occurred there within the last eight or nine years. I regret to say that I fear I shall have little opportunity of further investigating this interesting locality, as my friends are about leaving the neighbourhood.

Argynnis Aglaia. Not uncommon on the downs in July.

Apatura Iris. Has been taken in the woods, but rare.

Hipparchia Semele. On the downs and the sea-coast, July and August.

Sphinx Convolvuli. This species has several times been taken in the town.

Deilephila Galii and *Livornica*. A specimen of each has been taken, but I am sorry to say neither have come into my possession.

Trochilium crabroniformis. July, 1839, one specimen.

Stauropus fagi. I bred a male specimen from a larva found in August, 1840, feeding on the birch.

Notodonta ziczac. June, 1839, on wing.

Lophopteryx cuculla. Female, June, 1839, one, on wing, wasted.

Eriogaster lanestris. Larvæ, not uncommon in hedge rows.

Gastropacha quercifolia. Larva found occasionally in hedge rows.

Hypocampa Dominula. Not uncommon.

Spilosoma papyratia. June, 1842, one specimen.

Triphæna fimbria. Occasionally at sugar, July.

Cerigo texta. Occasionally at sugar, rare.

Charæas Graminis. Occasionally on the wing, July.

Agrotis corticea. Sugar, July, uncommon.

Agrotis æqua. Female, sugar, October, 1844, one specimen.

Agrotis suffusa. Sugar, common, September, 1844.

Agrotis puta. Sugar, August, 1848.

Agrotis fumosa. Sugar.

Agrotis obeliscata. Sugar, one specimen.

Graphiphora rhomboidea. Sugar, August, 1843.

Graphiphora triangulum. Sugar, August, 1843.

Orthosia munda. Sallows, April, 1844.

Orthosia sparsa. Sallows, April, 1844.

Orthosia litura. Sugar, September, 1843—44.

Orthosia macilenta. Sugar, September, 1843—44.

Mythimna Lithargyria. Sugar, July.

Glæa rubiginea. October, 1840, one specimen.

- Xylina Lambda*. Sugar, Autumn.
Xylina petrificata. Sugar, October, 1844—45, two specimens, both varieties.
Calocampa vetusta. Sugar, September, 1843, rare.
Calocampa exoleta. Sugar, October, 1843, 1844, and 1845.
Xylophasia sublustris. Sugar, July, 1844—45, rare.
Hadena Cucubali. Sugar, July, 1845.
Hadena capsincola. Sugar, July, 1845.
Miana literosa. Sugar. August, 1843.
Polia herbida. Sugar, June, 1845.
Thyatira derasa. Sugar, July and August, 1844—45.
Thyatira batis. Sugar, July and August, 1844—45.
Ceropacha diluta. Sugar, September, 1845.
Tethea retusa. Sugar, July, 1845.
Cosmia diffinis, and *Cosmia affinis*. Sugar, August, 1843, 1844, and 1845.
Xanthia aurago. Ivy, October, 1844.
Cucullia Lychnitis. See 'Zoologist' (Zool. 1142).
Catocala Fraxini. See 'Zoologist' (Zool. 30).
Cleora bajularia. June.
Ephyra omicronaria. August.
Harpalyce galiata. Sea-coast, Little Hampton, August.
Harpalyce silaceata. August.
Harpalyce corylata. June.
Anticlea rubidata. Hedges, August, 1845, scarce.
Phibalapteryx tersata. Hedges, July.
Phibalapteryx vitalbata. Hedges, July.
Phibalapteryx lineolata. Sea-coast, Little Hampton, August.
Scotosia rhamnata. August, 1845.
Eucosmia undulata. July, rare.
Polypogon tarsicrinalis. July, not uncommon.
Polypogon nemoralis. July, not uncommon.
Synaphe angustalis. July, 1845, Female, Arundel and Goodwood Parks, and on the downs, rare.
Cledeobia albistrigalis. July, 1845, Arundel Wood, rare.
Hydrocampa literalis. July, 1843, Arundel Park.
Margaritia ochrealis. July, sugar.
Margaritia flavalis. July, Arundel Park.
Margaritia ferrugalis. September and October, sugar.
Margaritia sericealis. July, common.
Chloephora prasinana. July, 1840.
Sericoris politana. July, 1845, downs, one.
Sericoris quadrana (Hub.) See 'Zoologist' (Zool. 1269).
Peronea fulvovittana. October, 1844, Arundel Park.
Cochylis griseana ? Goodwood and Arundel Parks, July, 1845.
Depressaria Badiella, *Depressaria purpurea*, and *Depressaria Yatesana*. All taken at sugar.
Crambus auriferellus. July, 1845, Downs.
Chilo caudellus. Marshy ground, Arundel Park.
Chaetochilus sequellus. July, sugar.

I may also mention, in addition to the Coleoptera recorded in the 'Entomologist' (Entom. 223), I have since met with *Choragus Sheppardi*, *Nedyus setiger*, *Gymnaëtron Beccabungæ*, *Syncalypta maritima*, and *Claviger foveolatus* in nests of *Formica nigra* as well as *flava*.—*S. Stevens*; 38, *King Street, Covent Garden, March 6th, 1846*.

Note on the capture of Lepidopterous Insects at Black Park, Bucks.—In the 'Zooologist' (Zool. 804), I have given a list of the productions of this interesting place up to September, 1844; this last season has produced a few more rarities which perhaps are worth recording in your pages, making the entomology of the place more complete, and showing to your readers the richness of the locality.

Colias Edusa. September, 1844.

Hipparchia Aegeria. Abundant in meadows adjoining the Park, in July.

Acherontia Atropos. Larvæ.

Chaonia Roboris. Larvæ, August, off oak.

Peridea serrata. Larvæ, August, feeding on oak.

Orgyia gonostigma. Larvæ, October, young.

Nemeophila Plantaginis. End of June.

Triphena fimbria. End of July, sugar.

Agrotis Agathina, *Graphiphora albimacula* of Stephens. September, on Heath, one specimen.

Orthosia populæti, *Orthosia munda*, *Orthosia sparsa*, *Achatia piniperda*, *Xylina semibrunnea*. On willow blossoms, in April.

Xylina Lambda. October, sugar.

Calocampa exoleta. On willow blossoms, April.

Xylophasia sublustris. One at sugar, early in July.

Hadena genistæ. May, sugar.

Hadena lythoriza. Trunks of trees, April.

Ceropacha diluta. Sugar, August.

Xanthia aurago. Sugar, October.

Xanthia croceago. Sugar, October.

Acosimetia arcuosa. Flying, July.

Himera pennaria. Flying, October.

Geometra lunaria. Larvæ, beat out of a fir.

Geometra delunaria. July.

Ellopiæ fasciaria. June.

Boarmia tetragonaria. April.

Boarmia abietaria. April.

Larentia multistrigaria. Abundant on trunks of trees, April.

Triphosia cervinata. April.

Lobophora viretata. June, rare.

Eupithecia togata. See 'Zooologist' (Zool. 1086).

Bapta punctata. June.

Nola Monachalis. Sugar, July.

Nola stringulalis. Bred, May.

Chloephora prasinana. At rest on a blade of grass adjoining the Park, early in July.

Chloephora Fagana. Larvæ, common, September and October.

Lozotania cinnamomeana. End of June, out of fir-trees.

Lozotania cruciana. End of June, off willows.

Ditula porphyriana. June, by beating.

Semasia splendana. July.

Sarrothripus ramosanus. Rare.

Sarrothripus Ilcanus.

Sarrothripus Degeneranus, and varieties. By beating, end of July till October.

Argyrolepis gemmana. Fir-trees, end of July.

Anacamptis Lyelella. Beating oaks, September.

Epigraphia Avellanella. Trunk of a tree, April.

Cecophora ———. New species, allied to *bimaculella*, but distinct.

Callisto fyeslella. End of June, sweeping in a swampy place.

Chrysocorys angustipennella. May and June, beating.

Porrectaria anatipennella. June.

Batia flavifrontella. July, beating.

Ilythia colonella. July, beating.

Phycita Abietella. July, on firs.

Plutella nemorella. End of July, flying in the evening.

Tinea semifulvella. July, beating.

Lampronia Hellwigella. June, beating.

Gracillaria Sulphurella. July and September, beating.

Pterophorus Heterodactylus. June, one, sweeping.

Besides the above, nearly all those species before recorded occurred last season, although many of them were not so plentiful as the previous year; on the whole I consider last season was but an indifferent one for collecting generally, the drought the preceding summer, combined with the havoc the birds made with the larvæ, was no doubt the cause that made insects scarce. I took a number of larvæ last autumn, principally Geometridæ, which are now laid up. I expect they will produce me some rarities.—S. Stevens; 38, King Street, Covent Garden, February 3rd, 1846.

List of Orthosia occurring near Doncaster.—The following list shows the dates of appearance this year of the species of *Orthosia*, &c. that inhabit this neighbourhood. The fine warm weather which occurred early in spring, by bringing the fallows into blossom so much sooner than usual, threw considerable light on the habits of the spring species, and explained especially the reason of *O. leucographa* having been hitherto found so rarely in a perfect state.

Feb. 21. *Orthosia munda*, made its appearance in the breeding-box of my friend, Mr. Evans.

Feb. 23. Took *O. munda* and *O. cruda*, with *Calocampa exoleta*, *Glæa vaccinii* and *satellitæ*, on sugar.

Feb. 24. *O. opima*, out in breeding-box.

Feb. 25. *O. stabilis*, with *Semiophora gothica*, on sugar.

March 10th. Took four *O. leucographa*, from willow blossoms in Wadworth Wood, with *O. munda*, *cruda*, &c. *Leucographa* had been taken at intervals during the previous fortnight at Levitt Hag.

March 17th. *O. instabilis* and *O. populeti*, willow blossoms.

March 20th. *O. gracilis*, with *Glæa rubricosa*, willow blossoms. *O. leucographa*, quite faded.

April 1st. *O. opima* and *O. miniosa*, willow blossoms.

O. populeti, *miniosa*, and *opima*, continued tolerably good until April 13th.

From the numbers which have been taken in this neighbourhood during the present season it would appear that, although *O. leucographa* is no doubt very local, it abounds in certain districts; and the fact of its very early appearance will account for the imperfect condition of most of the specimens heretofore captured. I should imagine the larvæ feed upon some plant peculiar to limestone, as the moth appears to be confined here entirely to the magnesian limestone tract, west of Doncaster. *O. munda* also abounds in the same locality. *O. opima* appears to prefer the rich loam and warp near the banks of the Don, while *O. gracilis* abounds chiefly on the peat lands of Potterie Car,—a reclaimed bog. *O. populeti* occurs with *Glæa rubricosa* in a moist, boggy wood, not more than two hundred yards from Sandal Beat,—a wood situated on dry, sandy gravel, with a slight covering of peat,—where *miniosa* is found, but *populeti* never seen. *O. munda*, *leucographa*, and *populeti* have appeared in much greater numbers than usual this season, while *instabilis*, *opima*, and *gracilis* have been unusually rare. It is a singular fact, that out of fifty-nine specimens of *O. munda*, which Mr. Evans reared from larvæ, there was not a single variety, all were marked exactly the same with the twin spots very faint; they were fed on poplar leaves. I have now a brood of *O. opima* feeding heartily on poplar, they have shed the first skin and assumed the green stripes.—*John R. Hawley; Hall Gate, Doncaster, May 7th, 1846.*

Capture of Lepidoptera in Scotland.—*Agrotis suffusa*, one Feb. 23rd, and one Feb. 28th, sugar, Boyd's Planting.

Calocampa exoleta, fourteen specimens, Feb. 16th to 28th, sugar, Boyd's Planting and Torwood.

Calocampa vetusta, seven specimens, Feb. 14th to 25th, sugar, Boyd's Planting and Torwood.

Anisopteryx Æscularia, one, Torwood, Feb. 16th.

Phigalia pilosaria, seven specimens, Feb. 14th to 25th, Torwood and Boyd's Planting.

Larentia multistrigaria, common, Torwood and Boyd's Planting.

The *Agrotis suffusa* are quite fresh specimens, and some of the *exoleta* and *vetusta* are also very fine.

The salallows have been in blossom at Torwood since the 14th of February, but none of the *Orthosiæ* seem to have found them out yet.—*H. T. Stainton; Lewisham, March 10th, 1846.*

Empis borealis, (Linn.)—This insect is recorded in Curtis's 'British Entomology,' p. 18, to have been taken in Wicklow early in May by Mr. Tardy. I have found it at the end of April on Bleasdale Moor, near Lancaster, and also at Hammerfest, Finmark, in July.—*Francis Walker.*

Immense Natural Beehive.—In a cavern on the right bank of the Colorado, about seven miles from Austin, there is an immense hive of wild bees. On a warm day, a dark stream of bees may be constantly seen winding out from the cavern like a long dark wreath of smoke. The stream often appears one or two feet in diameter near the cliff and gradually spreads out like a fan, growing thinner and thinner at a distance from the cavern until it disappears. The number of the bees in this cavern must be incalculably great, probably greater than the number in a thousand or ten thousand ordinary hives. The oldest settlers say that the hive was there when they first arrived in the country; and it is quite probable that it existed in the same state many years previous to the settlement of this country. It was estimated that there are many tons of honey and wax in this immense hive; and if its contents could be extracted readily,

they would doubtless be found far more valuable than the contents of any silver or gold mine, that adventurers have been seeking for years in that section.—*Texas Telegraph*, copied in the *English papers*, January and February, 1846.

Note on Queen Bees.—As most collectors are deficient in cabinet specimens of queen bees, they will be glad to have their attention directed to the following quotation from 'My Bee Book,' p. 285, where Mr. Cotton states "If you look closely before the mouths of your hives in June and July, you may pick up plenty of dead queens. I myself have found ten in the front of one hive.—*W. H. L. Walcott*; April 13, 1846.

Increase and decrease in weight of a Hive of Bees.—Having been much gratified by your occasional anecdotes of the honey-bee in your very interesting periodical the 'Zoologist,' I am induced to forward you for publication, and so to afford gratification in return, an account of the daily increase or decrease of a common straw hive, which I had suspended very accurately from a "Salter's Balance" during the whole of last summer. The hive was filled on the 24th of June, 1844 with an average swarm, and weighed on that day when first suspended 10lbs. 13oz. In the autumn of that year, it attained the weight only of 17lbs. 10oz., which decreased to 11lbs. 8oz. in February, 1845. From February to June 8th, it fluctuated never more than 1lb., and on the latter day it weighed 11lbs. 12oz. From this date the increase was rapid, and which I will state in a tabular form.

June.	1845.	lb.	oz.		
8.	11	12		
9. Very fine day	...	12	14		
10. Ditto	...	15	10		
11. Sunny and hot	...	17	12		
12. Ditto.	...	19	4		
13. Sunny and sultry	...	20	4		
14. Very sultry	...	20	14		
15. Cooler, heavy showers	...	20	15		
16. Sunny and still	...	21	2		
17. Sunny and hot	...	22	5		
18. Very rainy day	...	21	4	Decreased	1lb. 1oz.
19. Fine, sunny	...	22	6		
20. Sunny and warm	...	23	10		
21. Ditto	...	24	12		
22. Sunny, cold evening	...	25	5		
23. Sunshine, cold wind	...	26	0		
24. Dull, much rain	...	25	12	Decreased	4oz.
25. Dull, windy, cold	...	25	10	Ditto	2oz.
26. Sunny, cold air	...	26	10		
27. Rainy day, cold	...	26	2	Decreased	8oz.
28. Rain and storms	...	25	14	Ditto	4oz.
29. Very sunny and fine	...	27	0		
30. Sun, passing clouds	...	28	0		
July.					
1. Heavy rain, stormy	...	27	6	Decreased	10oz.
2. Cloudy, but warm	...	28	0		
3. Sultry, rain, thunder	...	28	1		
4. Warm, sunny	...	29	8		
5. Fair, sunshine	...	30	9		

July.	1845.	lb.	oz.			
6. Sunny, sultry	...	31	6			
7. Very fine, hot	...	32	0			
8. Sun, high wind	...	32	1			
9. Dull, rainy	31	14	Decreased	...	3oz.
10. Dull, thunder, rain	...	31	8	Ditto	...	6oz.
11. Rain all day	...	31	1	Ditto	...	7oz.
12. Sharp air, sunny	...	30	8	Ditto	...	9oz.
13. Cold air, dull	...	30	4	Ditto	...	4oz.
14. Cold, with showers	...	29	12	Ditto	...	8oz.
15. Cold and rainy	...	29	4	Ditto	...	8oz.
16. Dull and warm	...	28	10	Ditto	...	10oz.
17. Still and hot	...	28	12			
18. Sunny and warm	...	28	13			
19. Fog, dull, cold	...	28	4	Ditto	...	9oz.
20. Cold air, dull	...	27	12	Ditto	...	8oz.
21. Very fine, warm	...	28	7			
22. Dull, rainy	28	0	Decreased	...	7oz.
23. Dull, cold, rainy	...	27	8	Ditto	...	8oz.
24. Ditto.	27	0	Ditto	...	8oz.
25. Dull, but warm	...	26	8	Ditto	...	8oz.
26. Fine and warm	...	26	4	Ditto	...	4oz.
27. Dull	26	0	Ditto	...	4oz.
28. Fine, showery	...	25	12	Ditto	...	4oz.
29. Much rain	25	1	Ditto	...	11oz.
30. Cold rain	24	7	Ditto	...	10oz.

At this date my observations were discontinued, as I was obliged to leave home. The hive gradually diminished in weight till it drew but 19lbs. I then removed it at this weight from the balance and placed it in winter quarters. Since re-suspending it this spring, it has continued to decrease, and at this date, April 28th, 1846, it weighs but 13lbs. 7oz. The hive never swarmed, which takes away one point of interest I wish I could have furnished. My observations were taken every night exactly at ten o'clock. Should you be pleased to honor this humble communication with your approval, I shall be happy from time to time to furnish you with the result of my observations, not only of the above hive in particular, but generally of others (and I have sixteen others in my garden) on which I am about to try some trifling experiments. Might I be permitted to state that I had the good success of taking from a Nutt's hive last year a fine glass of honey 10lbs weight, and 21lbs. in addition from the side box. This hive swarmed, and the swarm weighed 28lbs. the 1st. of September, 1845. The parent-hive is now in very full vigour. The Nutt's box was stocked with two swarms united in June, 1845. I have to apologize for troubling you with so long a letter.—*H. R. Harrison; Newark, April 28th, 1845.*

[No apology is needed for a communication of this kind: it is to such careful observations as those here recorded that we are indebted for all solid knowledge in Natural History. I shall be glad to publish any further records with which Mr. Harrison can supply me.—*Edward Newman.*]

Callinome versicolor.—This species, like *Ormyrus punctiger*, is parasitic on *Cynips megaptera*, Panzer, which forms galls on the trunks of oak-trees. The female is gol-

den green, varied with cupreous: the oviduct is as long as the abdomen: the antennæ are black, except the first joint which is fulvous: the knees and tarsi are fulvous, and so are the tips of the fore tibiæ: the wings are fuscous. The male is described in the 'Entomological Magazine,' i. 136. The fly appears in April, and there is only one generation in the year.—*Francis Walker.*

Occurrence of Aepus fulvescens near Ventnor, Isle of Wight.—As I am not aware that *Aepus fulvescens* has been hitherto recorded as occurring in this district; I may mention that I took one specimen on January 30th, adhering to the under side of a stone below high water mark. It is remarkable that it should be taken so early in the season, while I have not since been able to meet with it, the shingly nature of the beach is certainly unfavorable to it, as it has little chance of escaping with whole bones.—*G. Guyon; Ventnor, Isle of Wight.*

Deviation from the usual formula of Striæ in Abax.—I know not whether the following case of monstrosity (if it can be so called) is sufficiently novel to be worth notice; but as it is the most decided case of the kind I have met with, I record it for the benefit of the world in general, and of entomologists in particular. On the 5th of March I took a male *Abax striola*, with the first and second striæ (from the suture) twice united, rather beyond the middle, leaving a small *strialess* space between. I have taken several specimens from the same spot, but without meeting with a similar example.—*G. Guyon; Ventnor, Isle of Wight, March 7th, 1846.*

. It has occurred to me, and I have mentioned to one or two of my friends who are of the same opinion;—that it would be much assistance to naturalists, if the inside of the wrappers of the 'Zoologist,' which are generally waste space, were devoted to receiving lists of duplicates, by which means exchanges of bird-skins, insects, &c., might be made to a much greater extent than at present, as there are many naturalists in all parts of the kingdom, able and willing to assist each other, but are unable to do so from ignorance of their mutual wants.—*G. Guyon.*

Remarkable instance of tenacity of Life.—Two years ago, whilst making a few preparations to illustrate the anatomy of insects, I employed amongst others, a good many *Geotrupes*. On Saturday, about noon, I severed the heads and abdomens of two specimens, leaving the bodies on my work-table. On Monday I accidentally perceived, to my great astonishment, that the parts still showed manifest signs of life, by slowly stretching and bending their legs.—*J. Bladon; Pontypool.*

Exploding property of Paussidæ.—A friend of mine, resident at Coimbatore, observed that several of the *Paussidæ* which he collected exploded carbonic acid gas in the same manner as *Brachinus crepitans*.—*C. Horne; Clapham Common, March, 1846.*

Singular use for a Buprestis at Madras.—The children in Madras play with a large common species of *Buprestis*, which has a green thorax, and brown elytra just in the same way as the children here do with cockchafers, except that instead of the cruel expedient of pinning the captive, they pass a horse-hair round the body between the thorax and elytra.—*C. Horne; Clapham Common, March, 1846.*

Occurrence of Trypodendron domesticum in the vicinity of Newcastle-upon-Tyne.—On the 31st of January, 1846, in the course of a short excursion on the banks of the Derwent, near Axwell Park, four miles from Newcastle-upon Tyne, I was so fortunate as to meet with *Trypodendron domesticum*, an insect rare in this country, and hitherto found only in the south. It occurred in some old beech logs lying on the ground, preferring the driest. The trees having been felled for some time, were rather decayed

and quite sapless. The insect, though somewhat local was in no scarcity. It was found in splits and chinks, and under the bark where loose; parties of six or seven, nestling together in a torpid state. They were quite recent, having it is probable lately issued from the lofty beeches still growing on the spot;—having been induced to choose their present situation, for the sake of shelter, till the genial sunshine should invite them forth anew. They appear to differ considerably in their habits from the bark beetles. The bark under which they lurked was always detached, was entirely destitute of vitality and nutriment; and presented none of those graphic touches which indicate the route of a destroyer, and by which, as it were, it records its own ravages. Their true residence is the interior of the tree. Almost all the prostrate trees,—huge logs some feet in diameter, are drilled with holes, of the size of those in “worm-eaten” furniture. A few of the insects were seen at the entrance of these, and some had gone into them, as if to reoccupy the deserted passages; but as all the holes were of remote formation, and showed no tokens of having been recently tenanted; I was brought to the conclusion, that whatever they were with respect to a former generation, they were not the nurseries of the numerous brood at present in their vicinity; but, like the bark and open fissures, were merely resorted to, as a covert from the night’s inclemencies: I could see nothing in the living-trees to sanction this opinion; no traces of the insects’ presence were any where observable in them; but as the roots of the branches are the favourite seat of insect attack, I consider that if they could have been examined, they would have furnished the requisite evidence. A solitary instance, however, presented itself, in the beeches at Axwell Park wall; where a branch having been cut off, an insect had settled on the festering limb, and pierced it to the core. The depth of the holes was various, some very slight, others above two inches; but the measurement being made from without is not conclusive. The timber was injured and blackened for a nail’s breadth round the sides of the hole. I found another good example of that adaptative instinct, so wonderful, as coming from creatures so minute, and so remote to our conceptions from the confines of intelligence; in the plan which some of the insects had taken to accomplish their purpose of gaining admission into the tree, with the least possible expenditure of labour. Some idler had carved pretty deeply in the smooth bark the figure of a star. This had been observed by the insects to be a favorable opening; and accordingly, the centre, the tip of each ray, with only one exception, and in several places the central line of the rays, were perforated as by a diminutive auger. If the tree were still fresh when this took place, no doubt the exudation of sap might also act as an incentive to this apparently fanciful, but really wise procedure. The holes were also more frequent in those places where the bark had earliest given way, being injured by the rain that frequently lodges in the clefts of large trees. *T. domesticum* is a pretty little creature; disposed to activity; totters rather than runs, with its tiny, pale antennæ carried in a curve; is very susceptible of warmth; and readily takes to flight, being provided with ample wings that well enable it to spread its colonies abroad. Judging from appearances, it is somewhat diffused in this neighbourhood, as, somewhat later two specimens were taken in the Ravensworth woods, some miles from the first locality; one in a beech, and the other in a detached branch of oak; and I have noticed in the rotting willows, mountain ashes, and other timber, several indications of the prevalence of this, or some allied timber-borer, in previous stages of their decay. Of the economy of *T. dispar* the other British species, an interesting and original account is given in Köller’s ‘Treatise on Injurious Insects,’ trans-

lated from the German, by the Misses Loudon, London, 1840.—*James Hardy ; Mulgrave Terrace, Gateshead.*

Comparative dates of the occurrence of some species of Coleoptera in the early months of 1845 and 1846, near Ventnor, Isle of Wight.—The list might have been swelled to a considerable extent, for during January and February alone I captured some hundreds of specimens, but I have preferred noticing such species only, as are of less general distribution. Of those quoted, *Thyamis dorsalis*, though local here, occurred throughout January in immense profusion, in company with *T. tabida*: the latter less abundant, was of a deep red colour (*var. rufescens*). The dates have reference to the days on which I secured the first specimens.

	1845.	1846.
<i>Thyamis dorsalis</i>	„	Jan. On Senecio Jacobæa.
<i>Haltica consobrina</i>	„	Feb. 26 to May. By sweeping, plentiful.
<i>Blemus pallidus</i> , and <i>Lymnæum nigropiceum</i>	Apl. 4.	„ 20. Under stones on the beach.
<i>Dromius bipennifer</i> , and <i>Anthicus tibialis</i>	Apl. 5.	„ 11. Ditto.
<i>Drypta emarginata</i>	„ 18.	March 3. Under stones near the shore.
<i>Trimorphus scapularis</i>	„ 19.	„ 5. Ditto.
<i>Otiorhynchus Ligustici</i> , and <i>Harpalus marginellus</i>	May 19.	„ 16. On sandy banks.
<i>Stenolophus Skrimshiranus</i>	„ 20.	„ 27. On a damp bank near the shore.
<i>Trachys minutissimus</i> , and <i>Limnichus sericeus</i>	„ 27.	April 3. Damp, sandy places, local.
<i>Oomorphus concolor</i>	„ 28.	Feb. 26 to May. By sweeping.

Among my captures during the present month are *Harpalus cupreus*, and *thoracicus*, *Dromius impunctatus*, *Polistichus vittatus*, and *Bledius tricornis*, &c. — *J. F. Dawson ; Ventnor, Isle of Wight, May 18th, 1846.*

Aphis of the Apple.—The *Aphis* that occasionally causes the failure of the greater part of the apple-crops is already very abundant on the buds, and will probably be very injurious to the development of the blossoms and of the fruit. The scarlet, velvet-like *Trombidium holosericeum* is also unusually common on the fruit trees, seeking for the *Aphides*, on which it feeds, but it is hardly sufficiently numerous to diminish the effect of their ravages. There seems to be no effectual way of averting the mischief caused by the *Aphides* of the apple tree ; great multitudes of the eggs may be destroyed by cutting away the useless wood from the trees in winter, but the number of insects on the fruit-bearing branches will not thereby be decreased.—*F. Walker ; Grove Cottage, Southgate, April, 1846.*

Rhodites of the Rose-gall.—In the month of April I observed that the mossy rose-galls, formed by *Rhodites Rosæ*, were much frequented by an insect resembling an *Achoreutes*. It is rather more than a line in length, and of a dark bronzed colour : the antennæ are black, four-jointed, and a little longer than the head : the legs are pale : the prothorax is short : the mesothorax and the metathorax are large : all the other segments are short.—*F. Walker ; Grove Cottage, Southgate.*

Microscopical Society of London.

March 18th, 1846.—A paper by the Secretary, John Quekett, Esq. "On the intimate structure of bone in the four great classes of Animals, viz. Mammals, Birds, Reptiles, and Fishes, with some remarks on the great value of the knowledge of such structure in classifying minute fragments of fossil organic remains," was read. After alluding to the highly important results obtained by Mr. Owen, by the aid of the microscope in determining the affinities of extinct animals, by means of their teeth, the author went on to state, that having for some time paid considerable attention to the structure of bone in the four great classes of animals, he had found certain characters peculiar to each great class by which a bone of one class could be distinguished from that of another. He then briefly described certain characters which were present in all bones, and then those which were peculiar to each class, viz. the Haversian canals and the bone cells, with their little tubes (canaliculi) proceeding from them, and he applied the characters derived from the bone cells to the determination of the class of animals to which any minute fragments may have belonged; for he had ascertained that the bone cells were smallest in birds, a little larger in Mammalia, and largest of all in the Reptilia; the bone cells of fishes were remarkable for their being so unlike either of the three preceding classes, that having been once seen, they could not easily be mistaken. The author then noticed the relative proportions of the bone cells and blood corpuscles of the same animal, and concluded by remarking, that however different the size of animals of the same class may be, the bone cells did not vary according to the difference in size: thus the mighty Iguanodon, some scores of feet in length, had no larger bone cells than the lowliest lizard which we trampled under our feet, nor the horse, or the ox, than the smallest of our quadrupeds, the mouse.

April 15th. J. S. BOWERBANK, Esq., F.R.S., *in the Chair.*—A paper entitled "Observations on the Structure and Nature of the *Filaria Medinensis*, or Guinea Worm," by G. Busk, Esq. was read. The author, before entering upon the account of the anatomical structure of the guinea worm, premised a short statement of what is known with regard to its habits, and the localities in which it occurs endemically. This was done in order to afford an opportunity of drawing probable conclusions as to the nature of the parasite, from consideration of its habits, as well as of its structure. It was mentioned that the *Filaria Medinensis* is very limited in its range of distribution, occur-

ring only in certain portions of the torrid and north temperate zones, in Africa and Asia. It is especially frequent on the coast of Africa, and thence derives its vulgar name of Guinea Worm. Together with this limited general range, it is also known that the disease caused by the worm has been sometimes observed to be periodical, and apparently connected with change of the seasons. And it is also known that however prevalent, or even general the worm may be in one place, for instance, on the coast of Africa, it will not be found in another only a few leagues distant. No restriction of intercourse at the same time existing between the two places. Notwithstanding this limitation in the range of the *Filaria*, no race of mankind is exempt from its attacks when exposed to what may be termed the contagion in those places where it is epidemic. But though carried about the world in this way, no instance of its spreading in any other countries than those indicated is known, unless it be a doubtful one in the Island of Caragoa. The deduction drawn from these facts, is that the *Filaria Medinensis* requires for its successful propagation certain conditions of nature external to the bodies inhabited by it.

The structure of the worm was described. When perfect, its average length is from four to six feet, and it presents a head or oral extremity, and a posterior or caudal extremity. The oral extremity is not frequently met with, owing to the circumstance that the worm invariably presents itself at the surface with that end first, which consequently is generally rubbed or pulled off before the case can come under observation. It appears, however, that this extremity is blunt and rounded, and furnished with a minute circular oval aperture, around which the integument is thrown into radiating folds. The body of the worm is cylindrical, and of uniform size, or nearly so throughout, and it terminates posteriorly in a pointed, and more or less acuminate extremity, which is also always more or less incurved. The difference in the degree of acumination and curvature are considerable in different individuals, and so much so, that the varieties have been elevated into marks of sexual distinction. An error, at one time adopted by Rudolphi, but which he afterwards abandoned. It is evident that no real ground for making a distinction from such a character is tenable, for the reason, that worms of every variety of tail will be found to contain young ones, and must consequently be held to be all of one sex. There is no anal or other opening visible at the caudal extremity of the worm, nor in any part of its length.

The worm is composed of an outer integument, and of an internal tubular cavity.

The outer integument is white, translucent, highly elastic and extensible, and marked with regular fine transverse or circular rugæ which cannot be satisfactorily referred to the existence of circular fibres. The membrane is composed of several laminæ of a fibrous texture, and the fibres composing these laminæ appear to be so arranged as to decussate each other in the alternate laminæ. The internal membrane or tube constituting the body of the worm is constituted of a delicate pulpy substance thrown into rounded folds or processes hanging as it were into the cavity or towards the axis of the animal. The pulpy substance constituting these processes is studded with numerous bright irregularly globular particles. Between the outer and inner tubes, runs on opposite sides of the worm, a long band of muscle which is continuous from one end to the other, and the fibres constituting these bands are not marked with transverse striæ. On each side of either of these muscular bands is a narrow tract of a substance of minutely granular aspect, and having down its centre what appears to be a slender channel or tube without distinct walls. It was hinted that these granular tracts were of the nature of nerves, no other trace of which, could at all events be observed. The cavity of the worm circumscribed by the lobular folds above described, is occupied by a grumous or pultaceous matter, in which the innumerable young are imbedded in greater or less proportion. In some worms or in some parts of them occupying the whole space, whilst in other instances the grumous matter predominates, and only a few young *Filariæ* are here and there observed imbedded in it.

Through this cavity also runs a narrow brownish coloured intestine, simple and straight, consisting of a delicate transparent membranous tube, and containing a brownish granular material. This intestine terminates near the caudal extremity of the worm in a pointed cœcal end.

The young *Filariæ* differ considerably in their outward form from the parent worm, being furnished with a long, tapering tail, which constitutes about two-fifths of the length of the body. The whole length of the young one being about one-fortieth of an inch. The anterior extremity is rounded, and exhibits a minute aperture, leading into what appears at first sight, a simple ventricular cavity, but which under particular circumstances is seen to be folded or convoluted. No trace of muscular bands nor of any separate intestinal tube can be observed in the young *Filariæ*. The young are very nearly of uniform size and appearance in all parts of the parent worm, but occasionally one less developed than the rest is met with. Intermixed with the

young *Filariæ* are numerous opaque oval bodies with an irregular outline and coarse granular aspect, and which appears to constitute a part of the grumous matter forming the matrix of the young, but there is nothing that can be considered in the light of ova, nor are the young ever observed to be attached in any way to the parent.

The life of the *Filaria Medinensis*, as a parasite, admits of being divided into two periods or portions; during the one of which it is latent or exhibits no sign of its presence in the human frame, and in the other it has manifested its existence by several external symptoms, and makes its egress either spontaneously or with the assistance of art. The former of these periods may be taken as extending over, from twelve to eighteen months. The worm, during this period does not appear to exert any injurious influence on the tissues among which it is lodged. When arrived at maturity, however, it comes to the surface, and is either brought away or comes away piecemeal; of course this affording an opportunity for the dispersion of the vivacious young with which its interior is crammed.

Taking all these facts into consideration, it was suggested that the *Filaria Medinensis* in its parasitic form presented an instance among the Nematoid Entozoa, of an intermediate or transition generation, such as have been shown to exist in most of the lower classes of animals by several naturalists, and especially by a Danish naturalist, Steenstrup, whose work on the subject of alternating generations, has recently been published under the auspices of the Ray Society. In this work the intermediate generation or form is provisionally termed a "nurse" or "nursing generation," and it may be thus briefly characterized:—

1st. That it is unisexual and female, inasmuch as it always contains young.

2nd. That the female apparatus is modified in all "nursery generations" by the abortion, or in the deficiency of certain portions of the generative tube—to wit, the ovary and oviduct. Nothing being retained but the uterus, or what is analogous to it. The "nurse" being as it were an "individualized uterus."

3rd. That it is always proligerous, never oviparous, and besides these points it may be remarked that in most cases where this mode of generation obtains the only way of escape for the young is by the rupture of the body of the parent.

It will be readily observed that the Guinea Worm agrees in all these conditions with the definition of a "nurse" or "nursing generation," and the supposition of its being in fact, a creature of that kind, is sup-

ported by the facts connected with its propagation and distribution from one person to another, which are so manifestly dependent upon external circumstances, that it may be fairly considered likely that the worm in some other form, or at least in some other stage of its existence will be found external to the body. A discovery that is reserved for the observer in those countries only where it is endemic.—*J. S. B.*

Rat fishing for Eels.—On the 24th of February, taking a walk with a companion, as we went along the side of the mill-race at Swalwell, near Newcastle-upon-Tyne, we noticed a common house-rat, making its way close by the edge of the water, among the coarse stones that formed the embankment. Curious to know what it could be doing there, we watched its progress downwards, until it reached the outlet of a drain; into which it had just turned, when it gave a sudden plunge; and as quickly reappeared in the stream with a middling sized eel in its mouth. It made for the edge, where it soon regained its footing; and this, from the steepness of the bank was a matter of difficulty; which was much increased by the eel, which it had seized a little above the tail, and was struggling vigorously to get free. Eels, at any time, as every youthful “troller” knows are troublesome gentry, very hard to manage; and it would require all the shifts of a rat, to cast a *knot on one’s tail*. Our’s attempted to get forward and turn a corner; where on a broader ledge he, peradventure, might have had “luck in his fishing.” But the desperate efforts of the eel rendered his footing so precarious, that rather than have a plunge for nothing, he was reluctantly obliged to drop it into the water. His first action afterwards, was to give himself a good shake, both to revive his spirits, and to rid his coat from the effects of his morning dip; and then, as before, he resumed his “contemplative recreation.” As our paths lay differently, I have nothing further to report of his good or evil success.—*James Hardy; Gateshead, March 23rd, 1846.*

Singular effect on Animals from swallowing the ashes of Hecla with their food.—A letter from Copenhagen, of the 16th of April, says:—The packet which arrived yesterday from Reikavik, in Iceland, has brought us letters from that town of the 8th of March, which give curious details respecting the malady under which the cattle were suffering, from having eaten grass, &c. covered with the ashes vomited by Mount Hecla. These ashes act more particularly on the bones of the animals which have swallowed them. Thus, on the bones of the feet, there are formed, in less than twenty-four hours, osseous excrescences of an oblong form, which gradually assume so formidable a development that they prevent the beasts from walking; the same phenomenon is then manifested in the lower jaw; which is at the same time enlarged, and extends in all directions so considerably, that it eventually splits in several places; whilst in the teeth of the upper jaw there is formed a species of osseous needles, very long and pointed, which take root in the lower jaw, and even traverse it,—a phase of the malady which always determines a fatal issue. As high winds had prevailed for some time, the volcanic ashes were scattered throughout the island, and a great number of cattle, especially oxen, cows, and sheep had perished. If the eruption of Hecla (say the letters from Reikavik) is prolonged for two months more, all the rural proprietors who have not enough hay to feed their herds,—and the majority are in

this situation,—will be obliged either to slaughter their cattle, or to abandon them to certain death on the pastures thus poisoned by the volcanic ashes.—*Times*; April 30th, 1846.

Admirable sagacity of a Fox in preying upon Game.—The following fact some time ago was related to me by a forester who had been an eye-witness of the fact; it struck me so with astonishment, that I thought it proper for communication to the '*Zoologist*.' One morning coming home from shooting, I observed at some distance a fox jumping continually up to a trunk of a tree of middling height, holding something in his mouth: on my examination what it was, I saw it to be a branch of considerable size. Anxious to learn the reason of this matter, I laid myself down quietly, cocking my double-barrelled gun. In a very short time the fox left the branch and sat himself down on the trunk preparing for a jump. Soon after I heard the approaching of a family of wild pigs, which after some time, were quite near to the trunk. At the moment when they passed the fox, he jumped down on one of the shoals (young wild pig) and returned with it to his elevated residence, preparing himself to begin a fat breakfast, quite careless to the impotent anger of the sow, who began to try to jump up to the tree and to root under it, when my first shot killed the fox, and the other, one of the best shoals, which induced her to fly.—*A. Lamek*; *Wandsbeck*, February 26, 1846.

Cattle moulting bones.—The singular fact of cows masticating bones, appears to have attracted the notice of many of your readers, but no satisfactory reason for this apparently unnatural appetite has been offered. I do not think this craving ought to be confounded with chewing leather and other indigestible substances, noticed by some of your contributors, which I should refer to the same cause which produces those unnatural appetites frequently observed not only in animals, but in human beings, when suffering from states of the digestive organs, accompanied by painful sensations: dirt-eating among the negroes in the West Indies in the bygone times of slavery, and the craving for chalk, tobacco-pipes, candies, and other absorbents felt by some females. The stomach of dogs which have died of hydrophobia always contain a large quantity of indigestible substances, such as the straw litter of the kennel, &c. which the animals greedily swallow, apparently with the desire of quelling some artificial internal sensation. Heapity too, will compel the use of a strange diet. The most singular and unnatural instance I ever witnessed, was what I may denominate a *cannibal* lamb. This animal was reared in the slaughter-house of a London butcher, and from its unnatural circumstance of birth and education, was brought up upon animal diet; and I have repeatedly seen this lamb eating a dish full of mutton suet, apparently with great relish. But the bone eating of cows, may be with great probability attributed to a very distinct cause from those painful cravings founded on disordered functions. I attribute it rather to an *organic instinct*, by which the animal is guided by some natural feelings to select articles of diet, which at the first view seem unnatural. Phosphate of lime is one of the most important constituents of milk, and from it as drawn from the milk of the parent, the solid matter is deposited in osseous structures of the infant animal. The loss of the phosphates from the milch cow must be very great and constant; and I think it is to supply this drain the animal greedily devours bones, of which the earthy portion is well-known to consist chiefly of phosphate of lime. Admitting this to be the true explanation of this fact, it might be well worth the attention of graziers, &c., for, if the pasturage or fodder of milch cattle or cows suckling calves, does not contain sufficient of the phosphate, a portion of bone dust might I

think, be added to their food with perfect advantage to the health of both parent and offspring.—*Henry Oxley Stephens ; Old Market Street, Bristol, April 6th, 1846.*

Cattle moulthing bones.—Although much has been said in the 'Zoologist' on the subject of cattle moulthing bones, I am induced to request a place in this interesting magazine for the following extracts from a volume of unpublished correspondence between the celebrated naturalist, G. Montague, F.L.S., M.W.S., &c., and Robert Anstice, Esq., F.G.S., &c., a venerable man, and an excellent naturalist, who died at Bridgewater in April last, aged eighty-seven. Mr. Anstice, in reference to the different kinds of food which Col. Montague had tried with the cormorant, wrote as follows:—"The instances you mention of the versatility of some birds in this respect are wonderful, and bring to my recollection the great change of manners and accommodation to circumstances, especially with respect to food, which I have had occasion to observe in some animals on ship-board ; a sheep picking a bone of salt beef is no uncommon sight there." Col. Montague, in reply, says:—"Speaking of the change of diet in some animals, it is not surprising that all quadrupeds should show a fondness for milk through life, but that birds should so readily like it, in so many instances, is extraordinary. The circumstances of sheep picking a bone of salt beef, is produced by the flavour of salt. In America the Indians sport most in the neighbourhood of salt springs in what they term licking places. This love of salt will readily induce cows and sheep to eat salt dried fish, and it is no uncommon diet in some of the most northern climes, in lieu of vegetables. I have seen my own cows take bones from my dog-kennel." The letters from which the above extracts are taken were written in 1814, not long before the close of Col. Montague's life. If the above should be acceptable, I shall probably furnish more to the 'Zoologist' from the same source.—*W. Baker ; Bridgewater, April 14th, 1846.*

Habit of the Raven.—Being of opinion that any anecdote tending to illustrate the manners, habits, or dispositions of animals can never be unacceptable to the editor of a magazine where all interesting and curious facts relative to natural history are recorded ; I therefore venture to relate what I consider to be a surprising instance of memory in one of the Corvidæ family. In the year 1836 when I was at Llandilo academy, one of my schoolfellows, while we were taking our usual half-holiday walk in Dynevor Park, climbed up a lofty elm-tree and captured three young ravens which were just about leaving their nest, two of them were given away, but one we kept in our play-ground, where we erected a shed and a perch for him about three feet from the ground ; we had him several months, but when he became quite familiar and a general favourite, his existence was terminated by a stone hurled at him by one of the town boys whilst pluming himself upon the wall. This bird, after he had satisfied the cravings of his *not small* appetite, used to conceal the remaining pieces of food under several loose stones which were close to his shed, and when hungry, repeatedly have I and other boys watched him going straight to the place where he concealed his *first morsel*, and so on to each stone in rotation. I was amused at the time, but it now astonishes me. For this lengthy notice I crave your pardon.—*E. J. R. Hughes ; Catherine Street, Whitehaven, March 12th, 1846.*

Rooks building on house tops.—Two pairs of rooks have built their nests, and are now rearing their brood of young ones, between the chimney-pots of two houses in

George Street, situated in a very thickly populated part of the town of Hull. Had this circumstance been stated to me by any casual observer, I should have thought he had possibly been mistaken as to the identity of the birds, and that they were jackdaws instead of rooks; but as I have been very particular in observing them myself, I can speak with perfect confidence, having on several occasions watched the old birds in the act of feeding the young ones, and am therefore quite satisfied that they are veritable rooks.—*G. Norman; Hull, May 19th, 1846.*

Habit of the Goldfinch and Canary.—I have discovered, or fancy I have discovered, rather a curious habit in a goldfinch and canary entrusted to my care. They are fed, amongst other things, on hempseed, of which they are particularly fond. On several occasions I have observed each of them, after taking a seed of this kind into its bill, throw it away without cracking it in the least. These rejected seeds were generally very fine and large in appearance; but when opened, I have invariably found that they were rotten specimens. How did the birds know this? Perhaps some of your correspondents can tell me.—*George Lewis; Cotham Hill Villa, Clifton, April 15th, 1846.*

Chaffinch, Quail, Ringdove, &c.—No where, that I can find, is any notice taken of a remarkable habit of this bird, namely, that of hawking in the air for insects of some sort, in the same manner as a flycatcher. I have remarked this peculiarity often, and have observed it more in spring than at any other season of the year. I hope some of your other correspondents will endeavour to explain this habit. *Quail*: Three specimens of this bird have occurred to my knowledge this spring and winter; one shot at Topham in Cambridgeshire, at the end of January; and two others obtained at a poulterer's at Bury St. Edmund's, in February or the beginning of March. *Ringdove*: one or two instances of the voluntary attachment of this bird to individuals have already been recorded in the 'Zoologist,' I am happy in being able to add to their number. A young wood-pigeon, brought up from the nest, has formed a great friendship towards a boy, whom it accompanies to his work in a garden, and what seems to me rather extraordinary, devours whatever worms its master's spade may chance to throw up. *Water-rail*: this bird, considered by some to migrate during the winter, (in this part of the country at least) certainly stays the whole year through, for I saw two shot on the 3rd of January, and its eggs are to be obtained in Norfolk every summer.—*Alfred Newton; Elden, April 21st, 1846.*

Occurrence of the Crossbill at Knaresborough.—I received on Monday last two specimens of the crossbill (*Loxia Curvirostra*) which had been shot from a flock of between thirty and forty, at New York, a place about twelve miles off. On the following day, but four specimens were seen, but were too wild to be approached within gunshot. They occurred in considerable abundance about eight years ago in this neighbourhood, from which date, until the present, they have not been seen. If the foregoing communication be thought worthy a place in the 'Zoologist,' the insertion will confer an esteemed favour.—*James Garth; Knaresborough, April 27th, 1846.*

Young White Blackbird.—Mr. Clements of Birlingham, near Worcester, a few days ago discovered a blackbird's nest in his garden; there were three young ones, two of which were of the usual colour, and the other was completely white. The latter is now in the possession of Mr. Abell, of this city, and will be preserved for the Worcestershire Museum.—*Worcestershire Chronicle; April 22nd, 1846.*

Ferocity of the Blue-headed Titmouse.—A curious incident having lately come under my notice, for the truth of which I can vouch, you may perhaps deem it worth in-

serting in the 'Zoologist.' As a gentleman, a short time since, was walking by a hedge, he observed upon the opposite side of it two blue-caps (*Parus cæruleus*) fighting upon the ground. And so earnestly were the little combatants engaged, that although he made his way through the hedge near the spot, (in doing which he must have made a considerable noise) they did not seem to observe him, but continued fighting, even allowing him to place his hat over them, before they desisted.—*E. G. Montford; East Winch, North Lynn, Norfolk.*

Curious Nesting-place of a pair of Robins.—Some months since a number of skulls (human) were discovered when digging close by the old wall of this town, (Clonmel) supposed to have been buried there during the siege by Cromwell. One of them was left in a basket to bleach on the seat of an open bower in the garden. A pair of robins took possession, and in place of brains, the skull now contains their nest and eggs on which they are sitting.—*James Clibborn; Anner Mills, near Clonmel, April 25th, 1846.*

A Household Robin.—At a gentleman's house in Darley Dale, a robin has domiciled for three successive winters, having had ingress and egress during the day, with the privilege of free access to a well-stocked larder, partaking at will of each dainty there. Its roosting place is usually the kitchen on a Christmas bough, which is still retained for its dormitory; it enters for the night at dusk of evening, having during the day occasionally sung for hours together to the domestics, as if to reward them for cherishing it thus bountifully. Each year it builds its nest in the trunk of a tree near the house, and feeds its young from the larder. Being so familiar with the household, it will fly undauntedly from room to room, and occasionally on the family breakfast table, sometimes perching and chirping as if to ingratiate itself with its hospitable entertainers.—*Derby Reporter.*

Early arrival of the Swallow in Cornwall.—Swallows were seen at this place on the 1st of April, and again on the 2nd, and by myself on the 4th. I heard the chiff-chaff for the first time on the 22nd of March.—*Edward Hearle Rodd; Penzance, April 5th, 1846.*

Protection to Nightingales.—A curious order of the police was issued at Berlin on the 2nd of March, 1846. With a view to prevent the diminution of nightingales in their natural state of liberty, it is decreed that every person in Prussia, who keeps a nightingale in a cage, shall pay an annual tax of *ten thalers* (forty francs), and that any person putting a nightingale in future into a cage, without giving information to the police, shall be fined *ninety thalers*.—*Times; April 4th, 1846.*

Late departure of the Swallow at Redcar.—Below I send a note of the late departure of the swallow in 1845 for insertion in the 'Zoologist,' should you deem it worthy a place therein. On the 3rd of December, being on the Sandhills, about two miles to the east of this place, I observed a swallow (*Hirundo rustica*) sporting very vigorously backwards and forwards along the high water mark below me. Another was seen the same morning sporting over the houses in this village; day cold, calm, and without sun.—*T. S. Rudd; Redcar, April 8th, 1846.*

Ornithological Note.—The 4th day of April, 1846, was one of the most inclement of the season. At two o'clock, P.M., during an extremely heavy snow shower, about thirty or forty small birds (which were believed to be sand martins) were observed skimming round and round close to the water, at the junction of the rivers Suir and Anner. They kept together and approached nearly within reach of the hand, appeared extremely weak and emaciated, and apparently indifferent to the presence of

those attracted by such an unusual circumstance. At three o'clock they suddenly disappeared, and not one has since been observed in the neighbourhood.—*Barclay Clibborn; Anner Park, April 25th, 1846.*

Further Notes on the Moorhen, in reply to Mr. Atkinson.—Having read in the May number of the 'Zoologist' Mr. Atkinson's further observations addressed to me relative to the moorhen's power of keeping itself submerged by means of its feet, I feel myself now called upon to give some reply to those and the previous observations which I have not noticed before; my reasons for not having sooner done so, it is now unnecessary for me to state. Let me first set forth the real points in difference, and then it will appear, whether I have "overlooked" or altered my position, or Mr. Atkinson has varied his. In the 'Zoologist,' (Zool. 498) appeared a paper of Mr. Atkinson's under the head, 'Notes on the Moorhen,' in which the following amongst other passages occur. After describing the habits of the dabchick and the moorhen, Mr. Atkinson states with reference to the latter bird: "But after diving, especially if pursued by a dog, it seldom comes to the surface again, but remains submerged with *merely its beak thrust out* for the purpose of respiration." He then goes on to remark upon dabchicks and moorhens, and the means they adopt of escaping when alarmed, and adds, with reference to the reappearance of a moorhen that had dived, and which he was watching. "The bill was first thrust higher out of the water, then followed the head as far as the eyes, and then the whole head. Careful glances were thrown round, and if all remained quiet, the whole bird presently reappeared, and it resumed its search after food. I apprehend that no moorhen — *that no bird whatever indeed*, could put itself into this posture, and retain it independently of external assistance. The feet are the instruments by which they are enabled to remain in the state of submergence." Now I conceived the words used by Mr. Atkinson "*this posture*," and again, "*the state of submergence*," could only mean *the posture* and *the state* of submergence before described; namely, with "the bill first thrust higher out of the water," and then "the whole head"; and that Mr. Atkinson must be understood to intend that in that state they held themselves by their feet, assisted by means of some external assistance; under that impression I sent the following observation to the 'Zoologist,' (Zool. 667.) viz. "I venture to trouble you with the following remarks which have occurred to me in consequence of reading in the April number of the 'Zoologist,' under the head of 'Notes on the Moorhen,' some observations with reference to the power which the moorhen possesses of 'submergence, and of keeping its body *and all but its beak or head* concealed under water, when alarmed by the approach of an enemy. It is stated by your correspondent, (Zool. 498) that the *feet* are the instruments by which they are enabled to remain in this state of submergence.' And that 'they lay hold of some weed or flag, and by the purchase so obtained, resist the tendency of the water to buoy up their bodies, &c.'" Those are the words used by me in first stating the nature of the question wherein I differed from Mr. Atkinson, in thinking that the feet were the power which enabled the moorhen "to remain in *this state* of submergence," namely that of "*its body and all but its beak or head* concealed under water." I then proceed to state my reasons for differing from Mr. Atkinson upon that point, and amongst others, that the same power of submergence being possessed by all the duck and diver tribes, the formation of whose feet prevents their acquiring any purchase or hold upon weeds, even if there were any within their reach, and after some further observations, I also added, "But I venture to suggest that the power of submergence is derived from another power possessed by the various classes of water-

fowl as well as other birds ; namely, that of being able to expel at pleasure the air within the various cavities of the body, and which, when the air-cells are filled with air, is the cause of the buoyancy and resistance to the water of the former class, and enables them to float without any effort or exertion to themselves, &c." And at the conclusion of those observations in allusion to land-birds, I have further stated that "I apprehend that without this power of ejecting or getting rid of the buoyancy caused by the air within the body of all descriptions of birds, that a hawk or any other bird desirous of making a swoop or sudden downward descent would not be able to effect this object so easily, unless the internal air was first expelled in addition to the force derived from volition, which it also possesses. Mr. Atkinson was pleased afterwards to animadvert with considerable severity and at considerable length, upon my observations as above stated, but to which I added no rejoinder, contenting myself with merely stating, some months afterwards, that I had since had an opportunity of watching for some time a moorhen, with all but its "head and neck and just the top of the back and tail completely under water," and that it kept itself in that position for a considerable time without the aid of any weeds for its feet, which I could all the time see, were not holding by anything whatever. But in the May number of the 'Zoologist,' Mr. Atkinson again renews his strictures on the subject, and quotes the following passage, the substance of which he had inserted in a previous number of the 'Zoologist.' "And yet, (Zool. 1326) if he (Mr. S.) will turn to my paper (Zool. 757) he will observe that I have expressed myself thus: 'If then W. H. S. maintains that moorhens or any other birds can keep themselves in what I call a state of submergence, without the aid of weeds or flags, or other objects external to themselves ; I beg leave to differ from him, if he means only that the moorhen, together with various other birds, is capable of maintaining itself in what I call a partially submerged state, I cordially agree with him.' But how does this "cordial agreement" in any way bear out what Mr. Atkinson has before asserted to be the fact, (Zool. 498) namely, "that no moorhen—that no bird whatever indeed, could put itself into this posture and retain it independently of external assistance." But after Mr. Atkinson's admission, that we cordially agree, that the power necessary to keep a moorhen, (or any other bird) to use his own words, "in a partially submerged state," is *not* derived from its feet holding upon any weeds ; then I am the more puzzled to know, where the line is to be drawn, and at what particular depth such power is required ; supposing the head and all parts of the bird's body to be under water. There are to me, many other startling circumstances in Mr. Atkinson's last observations, which I am desired to consider, but which I think do not apply to the matter in question. There is, however, another point unconnected with the moorhen's feet ; namely, with reference to my "suggestions" only, as to birds expelling internal air, which I would wish to clear up, and in which I have been totally mistaken. I did not for a moment mean to state, nor do I think, taking the whole context of what I did say, there is anything which can possibly support the supposition that I intended to maintain a moorhen or other aquatic bird, by merely ejecting or letting off two or three puffs of internal air, and clearing its air-cells, would by that means *alone* acquire the power of going straight to the bottom of the water ; and to sink at pleasure, and without any other power to enable it to do so. I only meant to convey the idea by that "suggestion," that by expelling a certain portion of internal air (for were it to expel *all* internal air it would also expel life itself) such expulsion of air might *aid* and *assist*, and be an *accelerating* cause "in addition to the power derived from volition" to enable it to submerge itself. The term "hypothetical,"

[which Mr. Atkinson seems to quarrel with, was used by me, because I did not find anything in Mr. Atkinson's previous statement that warranted me in believing he wished it to be understood, he actually *had* either seen, or shot, a moorhen while submerged *and* holding on by its feet to the weeds to keep itself down. The circumstance of Mr. Atkinson having seen weeds retained in the toes, *after* the bird had been shot in its concealment, (Zool. 498) might be a mere accidental circumstance, applicable to land-birds as well, who, in their last dying grasp often seize upon any substance which chances to be near them at that moment. But in the last (May) number, Mr. Atkinson states unequivocally the fact of his having seen and shot moorhens so submerged, and while holding themselves in that state by means of their feet. This, I confess, and the six reasons he begs me to consider, and his observations on decayed weeds sinking and remaining at the bottom, so as there to afford a hold to the moorhen's feet, surprises me not a little. Mr. Atkinson also stated (Zool. 498) "that *no bird whatever* indeed could put itself into this position and retain it independently of external assistance, and the feet are the instruments by which they are enabled to remain in the state of submergence." But how does this apply to the duck tribe and their feet when they are submerged "partially or wholly"? I fear too much valuable space in the 'Zoologist' has already been occupied in the discussion of this "trite subject" as Mr. Atkinson terms it, I am therefore desirous of terminating the dispute, and should not have alluded to it, had it not been forced upon me by Mr. Atkinson's last observations. But I would wish to submit the following questions to the consideration of the three gentlemen, after named, whose opinions, as well-known naturalists and sportsmen, will, perhaps, set the point at rest. I would refer the questions to Mr. Yarrell, Mr. T. C. Eyton, and Sir W. Jardine, namely: Do the moorhen and other aquatic birds when alarmed, descend to the bottom of the water and there remain submerged and in a quiescent state? and if so, Are the feet the instruments they use (by holding fast to weeds or flags) which enable them to keep the body in that state of submergence? — *W. H. S.; London, May 5th, 1846.*

Ventriloquism in Birds.—There is, I think, a power possessed by many birds, to which, although sufficiently singular, I do not ever remember meeting with any allusion in any work, either on natural history or general topics; I mean a power of producing effects similar or analogous to those produced by the ventriloquists. I suppose it must have happened to nearly all of us, perhaps many times in our lives, that hearing the note of some bird in a tree with tolerably thick foliage, we have found the sense of hearing insufficient to direct our eyes to the concealed minstrel; I know that I have looked up till my neck ached, in the vain effort, more than once, and have been foiled at last. Sometimes the sound seemed to me to come from the summit of the extreme branch on the right; sometimes from the midst of that on the left; now from the highest twig; and again, from the central shade. I was forcibly reminded of former neck-aching experiences one day in 1844, while walking along the Tweed: a narrow plantation skirted the river for some distance; and while resting in the shade, I was attracted by the note of a magpie, just above my head, I wondered that the wary bird had suffered me to approach so near it, and very noiselessly I tried to discover the distance of my chattering neighbour. The voice danced about like a Will-o'-the-wisp, —'twas now here; now there; one moment in the top of a fir; the next in the thick of an elm! I strained my eyes and got a crick in the neck, but never a glimpse of him of the lustrous green and black and white. I believe I spent ten minutes in vainly seeking to detect him, and I determined at last, to ascertain whether or no 'twas a

magpie that had undergone metamorphosis; and *once a bird, was now a vox, et præterea nihil.* (Vide Ovid). I threw a stone, not at the place whence the sound seemed to issue, but at one of them; my mysterious friend took the hint,—he disclosed himself and departed. *Erupit, evasit.* On another occasion, about the same time, I was walking along a road, on the left of which was a wheat-field, and at the bottom of the field a pond, which I knew to be tenanted by divers moorhens: about fifty yards above the gate out of the road into the fields, and three hundred yards from the pond, I heard the note or cry of the moorhen; I was convinced the bird was within twenty or thirty yards of me, or rather, it never entered my mind that it was not. I therefore went quietly and cautiously to the gate, and thought I should most likely be able to see the bird, supposing it was likely to be moving towards the pond. On reaching the gate, the sound seemed to come from a point twenty yards lower down the field; I waited some minutes, still it came from this same point, I moved on, it kept apparently at about the same distance before me. When I stopped, it stopped too; I mean it seemed to come during each halt from one and the same spot, about twenty yards in advance of me. When at length, I got to the pond there was the bird, moving about at its leisure, croaking away in the same measured manner as it had been doing for the last twenty minutes, and not appearing at all conscious that its unmusical note had anything in it capable of interesting even a wandering naturalist. The bird was at the pond, unquestionably when I first heard it, and I suppose had never moved ten yards from it all the while I had been listening and watching. And yet at first, as at every successive period, I could have sworn it was within thirty yards of me. Again, there is a similar peculiarity at times, at least, in the note emitted by the snipe in the spring, or breeding season. And I infer from Mr. W. Bree's note (Zool. 1066) alluded to by Mr. Cooper, (Zool. 1192) that he was imposed upon, as I was the first time I ever heard the sound. I transcribe my note, made some ten years since. "The so-called bleating or drumming of the snipe in the breeding season, appears to me more to resemble the buzzing of a large bee; so much so, that the first time I heard it, I began to look for the bee which I supposed was making the noise. I thought it had become in some manner entangled in the grass, and a long while did I seek in vain. I remember on subsequent occasions also, its notes seemed very closely to resemble the buzzing of a bee. When the snipe emitted the sound, it was descending in a sort of a curve, moving its wings very rapidly." (Zool. 1192). When the sound ceased, it had begun to ascend again, in a continuation of the same curve. "The keeper," referred to by Mr. Bree was unquestionably correct in the information he furnished. And Mr. Bree was unquestionably impressed with the conviction that the sound he heard was produced on the ground. And hence the snipe may, with great propriety, be set down as a ventriloquist. I am sure I never doubted for a long time, but that the sound came from the grass; and long did I maintain my search, and sorely was I puzzled at not seeing my bee. I may add, when I verified my observations as to the fact, that it was in the *air* that the bird produced the sound, and as to the peculiar concomitants of the sound, fifty times at least. And also I may add that the snipes were never once seen by me in the pasture, in which, at first, I looked for the bee. Their haunt was in a pool or bog in the warren adjoining the pasture, the pool being one hundred yards distant from the boundary fence. I will give one other instance of a bird's note being produced in one place and seeming to come from another. Walking one day in the neighbourhood of Leeds, I was delighted to hear the note of one of my great favourites among our songsters, I mean the woodlark. I was surprised at hearing it in that district, but still

I could not doubt; there was no question about the chant; I looked up, and round and round; followed the sound, so to speak, with my eye; but the songster was not to be seen: still I heard him, and still was he invisible; until at last, I began to think I was present at the "rehearsal" of the Prince Fortunatus of the woodlarks. I went home with my curiosity unsatisfied as to the whereabouts of my well-loved songster. Two or three days after the mystery was solved. I was calling on a lady in the neighbourhood, and there, in a cage at her drawing-room window, hung the woodlark; and merrily he sung as I sat by. The window in question was some fifty or sixty yards from the road in which I was walking when I first heard the note, but not to be seen from the road, through the intervention of a high wall. But still, though I, of necessity, changed our (*i. e.* mine and the bird's) relative positions whenever I moved, the sound ever seemed to be in the air above me. Now I have no theory to offer on this matter, I state the simple facts, and I daresay a hundred other observers can confirm them, if they do not think the task too trifling. I think that birds can produce some such effects *at will*. But I also suspect that some of them may be, or must be, accounted for on other grounds than the mere volition of the bird that produces them.—*J. C. Atkinson; 7, Belvoir Terrace, Scarborough, April 3rd, 1846.*

An account of the Birds found in Norfolk, with Notices of some of the rarer Species which have occurred in the adjoining Counties.
By JOHN H. GURNEY, Esq., and WILLIAM R. FISHER, Esq.

(Continued from page 1324).

Avocet, Recurvirostra avocetta. The avocet is occasionally killed in spring, but is now a rare bird in Norfolk. It was formerly not uncommon, and nested habitually in some of the marshy parts of the county. It is said that a colony which once bred in the marshes at Salthouse, was destroyed in order to obtain the feathers, for the purpose of making artificial flies.

Black-winged Stilt, Himantopus melanopterus. Has occurred in Norfolk several times, but is a very rare and uncertain visiter. We may remark, that the changes of plumage to which this bird is subject, appear to require further elucidation.

Black-tailed Godwit, Limosa melanura. Of occasional occurrence, chiefly during the months of spring and autumn. This species formerly nested somewhat freely in the marshy parts of Norfolk, but has now very nearly ceased to do so.

Bar-tailed Godwit, Limosa rufa. Is found on our coast in the autumnal months in considerable numbers, and occasionally during all the other months of the year, but as far as we have ascertained has not been known to breed in the county. It is, however, sometimes

obtained at the end of May in the full plumage of the breeding season.

Ruff, *Machetes pugnax*. Occurs in Norfolk in spring and autumn, and nests with us, but in much decreased, and we fear, still decreasing numbers.

Woodcock, *Scolopax rusticola*. The woodcock arrives in Norfolk in small flights in the month of September, and becomes more numerous in October and through the remainder of the autumn. Upon their arrival, these birds are frequently so much exhausted, as to be unable to reach the marshes, and have been known to fly against houses, and alight in streets.

The greater part of these leave as early in spring, but a few pair occasionally remain and nest in the county.

Great Snipe, *Scolopax major*. Occurs during the months of August and September, but only in small numbers.

Common Snipe, *Scolopax gallinago*. Is found with us throughout the year, and nests in most of the marshy parts of the county in the month of April. It is far less numerous in winter than in autumn and spring, during the former of which seasons especially, vast flocks of this species arrive on our coast, and disperse throughout the county. We have seen a common snipe, the beak of which for considerably more than half its length, was curved upwards like that of an avocet.

Jack Snipe, *Scolopax gallinula*. Arrives in Norfolk in the month of September, and remains with us till the end of April in somewhat considerable numbers, but is also less numerous in winter than in autumn and spring.

Brown Snipe, *Macrorhampus griseus*. This species has been taken once at Runton, in summer plumage. It has also twice occurred at Yarmouth, once in the winter, and once in the autumn dress; and a specimen was shot by Mr. Rising on his estate at Horsey on the 9th of October, 1845, and is now in his possession. It proved to be a male bird, changing from the summer to the winter plumage, and was in company with another of the same species, which was not obtained.

Curlew Sandpiper, *Tringa subarquata*. Of occasional occurrence on our coasts during the months of spring and autumn, and in the former season is sometimes obtained in the full plumage of the breeding season. It arrives about the end of July.

Knot, *Tringa canutus*. Arrives on the coast in the month of August, and is found through the autumn in considerable numbers;

it leaves us in spring about the end of May, at which period it is occasionally found in the full red plumage of summer.

Buff-breasted Sandpiper, *Tringa rufescens*. Single specimens of this bird have at different times been obtained in autumn about the middle of September, on our eastern coast.

Broad-billed Sandpiper, *Tringa platyrhynca*. A specimen was killed at Breydon, near Yarmouth, on the 25th of May, 1836.

Little Stint, *Tringa minuta*. Occurs on our coast in the month of May, and also in August and September, at the latter period in rather considerable numbers; but it does not remain long at either season. One of these birds, which was slightly wounded in the wing, was brought to a house near the coast, and turned loose in an upper room. It fed greedily on flies taken from the windows, which it ate from the hand, within a few hours of the time of its capture. It lived in this manner for about a week, but died on being removed inland.

Temminck's Stint, *Tringa Temminckii*. Occurs occasionally at the same times, and in much the same manner as the last species; but less regularly and much less numerously.

Pectoral Sandpiper, *Tringa pectoralis*. A specimen was killed on Breydon, October 17th, 1830.

Dunlin, *Tringa variabilis*. Very numerous on the coast during the autumn and early spring, but less plentiful in winter. It is occasionally obtained during the remainder of the year, but we know no authentic instance of its nesting in the county.

Purple Sandpiper, *Tringa maritima*. Is found on our coast in September and the three following months, and also in early spring, but not in large numbers, although from its great tameness, it is often killed.

Land Rail, *Crex pratensis*. Birds of this species are not uncommon in some parts of the county in summer, and are known to breed in the neighbourhood of Diss; but the greater part of them appear to pass more to the North for the purpose of nesting, merely visiting us on their passage in spring and autumn.

Spotted Crake, *Crex porzana*. A not uncommon summer visitant, breeding in the vicinity of several of the broads. It arrives late in March, and leaves about the end of September.

Little Crake, *Crex pusilla*. Very rare.

Baillon's Crake, *Crex Baillonii*. Very rare, but less so than the preceding species.

Water Rail, *Rallus aquaticus*. Common, breeding in several parts of the county, and remaining throughout the year.

We know an instance of a water rail being found dead, with a fish of the kind called Miller's thumb (*Cottus gobio*), fixed in its throat, in a vain attempt to swallow which, the bird had been choked.

Moorhen, *Gallinula chloropus*. Very common throughout the year, and breeds in Norfolk. We have taken the eggs of this species in a fir plantation, which was situated at least a quarter of a mile from the nearest piece of water.

Common Coot, *Fulica atra*. Common throughout the year, especially in the district of the broads. In the autumn coots assemble in flocks, and frequently repair to the salt marshes in the neighbourhood of the coast. When thus collected, they appear to have a curious method of repelling the attacks of birds of prey. "Upon the appearance of a kite or buzzard," says Sir T. Browne, "they unite from all parts of the shore in strange numbers; when, if the kite stoops at them they will fling up, and spread such a flash of water with their wings, that they will endanger the kite, and so keep him off again and again in open opposition." We have never had an opportunity of verifying this assertion by our own experience, but a somewhat similar occurrence is related by Messrs. Sheppard and Whitear in their 'Catalogue of Norfolk and Suffolk Birds' in the following words: "The larger kinds of gulls often attack and devour coots. We have observed the latter, on the approach of their enemy rush together from all quarters, and form a close, round, compact body, appearing like bees in the act of swarming. The gull kept hovering over their heads, and frequently dashed within a yard or two of them. Whenever he flew to a distance the coots dispersed, and again at his return flocked together."

Gray Phalarope, *Phalaropus lobatus*. One or two specimens generally occur every autumn in the months of October and November; and this species occasionally, but less frequently, also visits us on its passage northwards in spring.

Red-necked Phalarope, *Phalaropus hyperboreus*. Occasionally, but very rarely occurs in a similar manner.

Gray-legged goose, *Anser ferus*. This species is said to have formerly visited Norfolk, but we never remember to have seen a specimen taken in the county. We are, however, informed that it is still occasionally, though very rarely met with.

Bean Goose, *Anser segetum*. Not uncommon in autumn, winter,

and early spring. A pair were killed at Horsea, in March, of the present year, which appear to have been inclined to nest there.

Pink-footed Goose, *Anser brachyrhynchus*. Not unfrequently met with.

White-fronted Goose, *Anser albifrons*. Not uncommon at the same seasons as the bean goose.

Bernicle Goose, *Anser leucopsis*. Not uncommon in winter.

Brent Goose, *Anser torquatus*. Common in winter.

Red-breasted Goose, *Anser ruficollis*. One specimen is mentioned by the Messrs. Paget to have been obtained by Mr. Wigg in Yarmouth market.

Egyptian Goose, *Anser Egyptiacus*. Birds of this species are frequently killed in Norfolk; amongst which, it is probable that those which occur on the coast after high easterly winds are genuine wild examples, but the majority are doubtless birds which have escaped from confinement.

Canada Goose, *Anser Canadensis*. It is very doubtful whether the Canada goose, which is also frequently found, has occurred in a really wild state.

Hooper, *Cygnus ferus*. Not unfrequent in winter, especially in severe seasons.

Bewick's Swan, *Cygnus Bewickii*. Almost as common as the last, and frequently occurs in milder weather.

Common Sheldrake, *Tadorna vulpanser*. Not uncommon; breeding among the sandhills on the coast.

Shoveller, *Anas clypeata*. Not uncommon in autumn and spring, and occasionally remains to breed.

Gadwall, *Anas strepera*. Occasionally occurs during the months of winter and spring.

Pintail Duck, *Anas acuta*. Not uncommon in autumn, winter, and early spring.

Wild Duck, *Anas boschas*. Very common in autumn and spring, and some remain to breed.

Garganey Duck, *Anas querquedula*. Not uncommon in autumn and spring, and has been known to breed in Norfolk; those which do not remain for that purpose leave us about the month of April.

Teal, *Anas crecca*. Common in spring and autumn, and frequently also in winter. Some birds of this species generally remain to breed in the county.

Wigeon, *Anas Penelope*. Very common at the same seasons as

the teal; and we believe has been occasionally known to breed in Norfolk.

Eider Duck, *Somateria mollissima*. We have seen immature examples of the eider duck, which have been killed on the coast.

Steller's Western Duck, *Somateria dispar*. An adult male specimen was killed at Caister, near Yarmouth, in February, 1830, and is now in the Norwich Museum.

King Duck, *Somateria spectabilis*. The capture of a female on Breydon, in July, 1813, is recorded by the Messrs. Paget, on the authority of Mr. Wigg; and we have seen a male bird which is said to have been killed near Lowestoff, though we do not place much reliance on the authority for this latter example.

Velvet Scoter, *Oidemia fusca*. Occasionally killed in winter, mostly on the coast, but not exclusively so.

Common Scoter, *Oidemia nigra*. Very common on the coast in winter, and sometimes occurs inland. We have noticed the occurrence of the immature bird in the month of July.

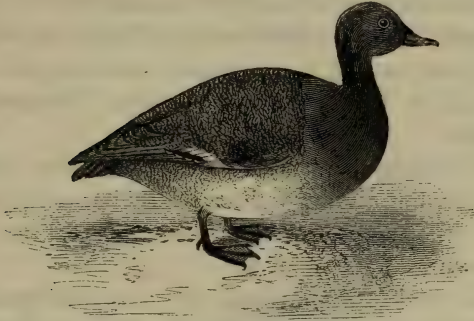
Red-crested Whistling Duck, *Fuligula rufina*. Has occurred several times in Norfolk. A description of a male specimen in very fine adult plumage, which was killed on Horsea-mere, on the 12th of January, 1844, occurs in the 'Zoologist,' (Zool. 576).

Pochard, *Fuligula ferina*. Common in autumn and spring, and frequently in winter, and has been occasionally known to breed in the county.

Ferruginous Duck, *Fuligula nyroca*. Sometimes met with in autumn and spring. A male bird, taken several years ago in a decoy near Holt, is still living in a state of confinement and perfectly healthy.

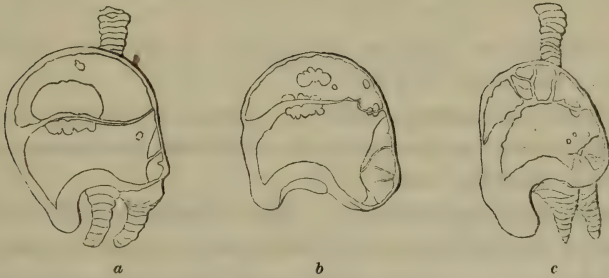
The following engraving represents a bird, intermediate in size, between the ferruginous duck and the common pochard, and probably a hybrid, the occurrence of which on Rollesby broad, in February, 1845, is mentioned in the 'Zoologist,' (Zool. 1137). The beak, legs, and feet closely resemble in form and size those of the common pochard. The back and wing coverts are freckled, and the tips of the feathers on the belly are changing from their original yellowish brown colour and assuming a freckled appearance. The flanks are freckled. The eyes are yellowish white, and it is remarkable that although the bird is decidedly smaller than the common pochard, the eyes when removed from the head, were found to be much larger than those of the latter bird. The head and neck are of a rich chestnut, which at the lower part of the neck (where the common pochard becomes

black) changes to a much darker tint, which extends over the breast and shoulders. The wings nearly resemble those of the ferruginous duck in colour and markings, but are much larger. A feather from



Supposed Hybrid Duck.

the axillary plume has the form of the corresponding feather in the common pochard, but resembles that in the ferruginous duck, in being freckled at the end. The bird proved, on dissection, to be a male, and we have endeavoured to show in the centre figure of the engraving below, the form of the bony enlargement of the trachea.



a. Bony labyrinth in the Trachea of the Common Pochard. b. The same part in the supposed Hybrid. c. The same part in the Ferruginous Duck.

The figure on the left hand represents the same part in the common pochard, and that on the right in the ferruginous duck. The specimens from which the two latter drawings were made, were kindly lent us by Mr. Yarrell. It will be seen that, although the trachea of the hybrid bird resembles in some respects that of the nyroca, it approximates more closely to the common pochard.

Scaup Duck, *Fuligula marila*. Not unfrequently killed in autumn, spring, and winter.

Tufted Duck, *Fuligula cristata*. This species is more common than the last, but occurs at similar seasons.

Long-tailed Duck, *Fuligula glacialis*. The immature birds are not uncommon towards the end of autumn and in the winter, and adult specimens occasionally occur in severe weather.

Harlequin Duck, *Fuligula histrionica*. Mentioned by the Messrs. Paget to have been bought in Yarmouth market by Mr. Wigg. An adult male, said to have been killed near Yarmouth is in the Norwich Museum.

Golden Eye, *Fuligula clangula*. The immature birds are quite common in winter, but adult specimens only occur in severe weather. This species is called at Yarmouth "rattle-wings," the tufted duck being there known as the golden eye.

Buffel-headed Duck, *Fuligula albeola*. An adult male bird, killed near Yarmouth is in the possession of Mr. Miller. It is said by Mr. Lubbock, on the authority of the late Mr. Girdlestone, (1828) that "this species is known to the Yarmouth gunners as the 'little rattle-wing'; that it is the hardiest species of fowl known on the coast, remaining at sea when all others are driven southward by stress of weather."

Smew, *Mergus albellus*. The smew, in its immature plumage, is not uncommon in winter and early spring; but the adult bird is more rare.

Hooded Merganser, *Mergus cucullatus*. A specimen was killed at Yarmouth in the winter of 1829.

Red-breasted Merganser, *Mergus serrator*. Occurs in winter, generally in severe weather; but the immature specimens are much more common than the adult.

Goosander, *Mergus merganser*. The immature bird is of frequent occurrence in winter, being only met with in the adult state in very severe weather.

Great Crested Grebe, *Podiceps cristatus*. Common, breeding on most of the broads which it frequents throughout the year, unless those waters become frozen; when it leaves them and retires to the coast and running streams.

Red-necked Grebe, *Podiceps rubricollis*. A regular and common visitant in early spring and late in the autumn; at the former season it occasionally happens that a pair of these birds remain, and nest in the county.

Slavonian Grebe, *Podiceps cornutus*. This is also a regular and common visitant to Norfolk, at the same seasons as the preceding

species. It sometimes, though very rarely, remains in spring late enough to have assumed the plumage of the breeding season, and when this is the case, it probably, sometimes breeds in the county.

A specimen which had been slightly wounded in the wing, lived some weeks in confinement. It would eat in a day four gudgeons, of three or four inches in length ; swallowing them whole, with the head downwards.



The Eared Grebe in summer plumage.

Eared Grebe, *Podiceps auritus*. Has hitherto occurred as a very rare summer visitant, possibly sometimes nesting in the county. In the month of April last, no less than five specimens of the eared grebe were killed within a week at Wroxham and other places in the county, and it is somewhat remarkable that these have all proved, upon dissection, to be male birds.

Little Grebe, *Podiceps minor*. Common throughout the year, and breeds with us. Like the great crested grebe, it prefers small running streams during frosty weather, frequenting at other times the larger pieces of standing water.

Great Northern Diver, *Colymbus glacialis*. Common in winter, and occasionally, but far more rarely, occurs in summer.

Black-throated Diver, *Colymbus arcticus*. Sometimes met with in winter, but has been very rarely obtained in summer plumage.

Red-throated Diver, *Colymbus septentrionalis*. Very common in winter, and occasionally met with in summer plumage.

Common Guillemot, *Uria troile*. Common on the coast, except during the breeding season. A few formerly bred on the cliffs at Hunstanton, but have now nearly, or perhaps, entirely ceased to do so.

Little Auk, *Mergulus alle*. Occasionally procured on the coast in autumn and winter, but is extremely uncertain in its appearance. It appeared on the coast in great numbers in the month of October, 1841. (Zool. 182).

Puffin, *Fratercula arctica*. Occasional in autumn.

Razor-bill, *Alca torda*. The young are of common, and the adult birds of occasional occurrence on the coast at all times of the year, except during the breeding season.

Common Cormorant, *Phalacrocorax carbo*. Common in the neighbourhood of the broads, especially in autumn; formerly, according to Sir T. Browne, "building at Reedham, upon trees, from whence King Charles the First was wont to be supplied." Since that time, they have been known to build near Fritton decoy in Suffolk, taking possession for that purpose, of part of a rookery.

Shag, *Phalacrocorax graculus*. Occasionally met with; the specimens, which chiefly occur in autumn, being mostly immature.

Gannet, *Sula alba*. Not uncommon in autumn, following and preying upon the shoals of fish which pass along the coast at that season. It is also sometimes taken in spring. The following is worth extracting from Sir T. Browne's 'Account of Norfolk Birds': "An onocrotalus, or pelican, shot upon Horsey Fen, May 22nd, 1663, which stuffed and cleansed, I yet retain. It was three yards and a half between the extremities of the wings; the chowle and beak answering the usual description; the extremities of the wings for a span deep brown; the rest of the body white; a fowl which none could remember upon this coast. About the same time I heard one of the king's pelicans was lost at St. James's; perhaps this might be the same."

Caspian Tern, *Sterna Caspia*. Has occurred several times both in adult and immature plumage.

Sandwich Tern, *Sterna Boysii*. Sometimes occurs on the coast in early spring and autumn.

Roseate Tern, *Sterna Dougallii*. This species is mentioned by the Messrs. Paget as having been met with at Yarmouth.

Common Tern, *Sterna hirundo*. Very common in spring, summer, and autumn; and breeds at Salthouse, and some other shingly parts of the coast.

Arctic Tern, *Sterna arctica*. The arctic tern is not uncommon in

early spring and autumn, on its passage to and from its breeding places in more northern localities.

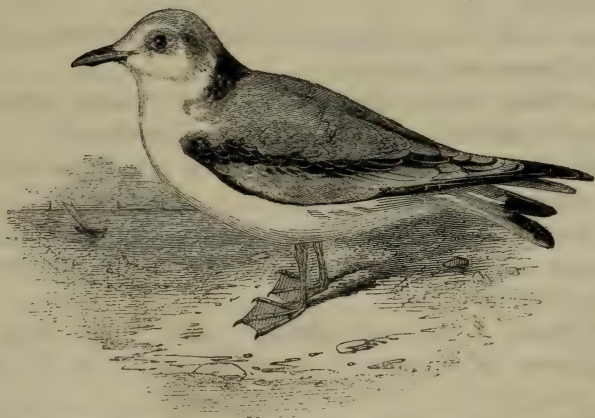
Gull-billed Tern, *Sterna anglica*. We have seen a specimen of this bird, which was said to have been killed in West Norfolk.

Lesser Tern, *Sterna minuta*. Common in spring, summer, and autumn, and breeds in localities similar to those frequented by the common tern.

Black Tern, *Sterna fassipes*. The black tern is common in spring, on its passage to its breeding grounds in a more northern district, and also occasionally occurs on its return in autumn. We believe that it formerly bred in some numbers at Winterton, but that it has now ceased to do so.

Little Gull, *Larus minutus*. A few specimens are generally obtained every year in their vernal and autumnal migrations. A little gull was killed in the month of November, 1843, on a small piece of water within the city of Norwich, to which locality it had been apparently attracted by the sight of some tame ducks.

Black-headed Gull, *Larus ridibundus*. Very common in Norfolk, and breeds in great quantities at Scoulton, and also on some of the Broads, dispersing during the winter about the coast. This species is observed to follow the plough in large numbers like the rook.



Young of the Kittiwake.

Kittiwake Gull, *Larus tridactylus*. Common on the coast (except during the breeding season) and especially so in autumn.

The kittiwake represented in the engraving (a young bird killed shortly after the breeding season) affords a curious example of the variations which frequently occur in the form and relative length of the tail and wing-feathers of this and many other gulls. The tail in the adult bird is square, or nearly so, at the end, whilst that of the bird figured is considerably forked—a peculiarity which in almost any other genus might be considered as a mark of specific distinction.

Ivory Gull, *Larus eburneus*. Mr. Miller has a fine specimen, killed some years since at Yarmouth.

Common Gull, *Larus canus*. Common on the coast, except during the nesting season, and most numerous in autumn.

Iceland Gull, *Larus leucopterus*. Very rare in adult plumage; but the immature birds are not unfrequently met with late in the autumn.

Lesser Black-backed Gull, *Larus fuscus*. Occurs on the coast throughout the year, except during the nesting season; but not in large numbers.

Herring Gull, *Larus argentatus*. Common on the coast at the same seasons as the last species.

Great Black-backed Gull, *Larus marinus*. Common on the coast, except in the breeding season. Both this and the two preceding species are somewhat more numerous in autumn than at any other time of the year.

Glaucous Gull, *Larus glaucus*. Has been occasionally killed, generally in immature plumage.

Common Skua, *Lestris catarractes*. The common skua is sometimes met with in Norfolk; most commonly in autumn.

Pomarine Skua, *Lestris pomarinus*. Of occasional occurrence; especially immature birds in autumn.

Richardson's Skua, *Lestris Richardsonii*. The immature birds, in various stages of plumage, are occasionally found in autumn; but the adult birds are rare.

Buffon's Skua, *Lestris parasiticus*. The young birds not unfrequently occur in autumn, in a manner similar to the preceding species.

Fulmar Petrel, *Procellaria glacialis*. Sometimes taken off the coast in autumn.

Manx Shearwater, *Puffinus Anglorum*. Rare. Sir Thomas Browne refers to "a sea-fowl called a sherewater, somewhat billed like a cor-

morant, but much lesser," which may be either this species or the greater shearwater, (*Puffinus major*).

Wilson's Petrel, *Thalassidroma Wilsoni*. A specimen is said to have been taken some years since at Salthouse.

Fork-tailed Petrel, *Thalassidroma Leachii*. A fork-tailed petrel was found dead on the beach at Yarmouth in December, 1823.

Storm Petrel, *Thalassidroma pelagica*. Occurs generally every autumn or winter in small numbers, and is occasionally very plentiful, for a short time, after severe gales.

CONCLUDING OBSERVATIONS.

It must be stated that the preceding Catalogue, although it will apply, with probably only a few trifling exceptions, to the whole district of the eastern counties, has been prepared from observations and notes, chiefly made in the eastern part of Norfolk.

The total number of birds included in it is 277, of which 81 are residents, and 196 are either regular or occasional migrants; the large proportion of which latter is sufficiently accounted for by the position and aspect of the district in which they are found. For whilst its easterly situation, and its projection into the German Ocean, afford great facilities for the visits of the migratory species, the great diversity of its soil, and the abruptness of the transition from one formation to another, producing a corresponding variety of natural and artificial produce, and a consequent abundance of food and shelter, render it still further attractive both to these and to the resident tribes.

The coast, although destitute of rocks, possesses almost every other form of beach and cliff, and is in some places bordered by salt marshes; and the eastern parts of the county are further diversified by large tracts of, in many cases, shallow water, bordered by reeds, and termed "broads." The part called Breydon, which is several times mentioned in the Catalogue, differs from these in being subject to the full influence of the tides, and it consequently presents alternately a (literally) *broad* sheet of salt water, and an immense extent of mud-banks abounding with the food of the various species of water-birds. It is also surrounded by a large tract of salt and fresh-water marshes.

We now proceed to add a few observations on the birds contained in the Catalogue, chiefly with reference to the movements of the migratory species, and in order to consider them the more conveniently, we have, as will be seen in the following analysis, divided them into two great classes, viz. *residents* and *migrants*, the former of which we

have subdivided into two, and the latter into four classes. And having found that some birds are both of a resident and migratory nature, we have, in order to avoid confusion in the total number of each family, placed such species in the second division of the resident birds.

			Residents.		Migrants.				Total.
			Remaining through the year.	Receiving an increase in Autumn.	Regular.			Occasional or irregular visitors.	
					Summer visitors	Winter visitors.	Spring or Autumn visitors.		
Falconidæ	...	...	5	1	1		2	7	16
Strigidæ	...	...	2	2				4	8
Laniadæ	...	...			1			2	3
Muscicapidæ	...	...			1		1		2
Merulidæ	...	...	3			2	1	2	8
Sylviadæ	...	...	3	1	15			4	23
Paridæ	...	...	6						6
Ampelidæ	...	...						1	1
Motacillidæ	...	...	1		1		1	1	4
Anthidæ	...	...		1	1	1		1	4
Alaudidæ	...	...	1	1				1	3
Emberizidæ	...	...	2	1		1		1	5
Fringillidæ	...	...	6	1		3	2	4	16
Corvidæ...	...	...	7			1		3	11
Picidæ ...	...	...	3		1			1	5
Certhiadæ	...	...	3					1	4
Cuculidæ	...	...			1				1
Meropidæ	...	...						2	2
Halcyonidæ	...	...		1					1
Hirundinidæ	...	...			4			1	5
Caprimulgidæ	...	...			1				1
Columbidæ	...	...	2		1				3
Phasianidæ	...	...	1						1
Tetraonidæ	...	...	4		1				5
Struthionidæ	...	...						1	1
Charadriidæ	...	...	3		1	4	2	1	11
Gruidæ ...	...	...						1	1
Ardeidæ	...	...	1	1				8	10
Scolopacidæ	...	...	3		1	3	14	7	28
Rallidæ	...	...	2		2			2	6
Lobipedidæ	...	...	1				1	1	3
Anatidæ ...	...	...	7			21		9	37
Colymbidæ	...	...	2			3	2	1	8
Alcadæ ...	...	...					3	1	4
Pelecanidæ	...	...					3		3
Laridæ ...	...	...	3				12	12	27
TOTAL ...			71	10	33	39	44	80	277

Of the birds which remain in Norfolk throughout the year, we shall merely remark that several species which are now included in this class will probably be ascertained by future observations to belong to one or other of the two migratory divisions of which we shall next speak.

The first of these, consisting of birds which migrate to our coast in autumn and form a temporary addition to the permanent residents of their own species, comprises several of the smaller land birds, amongst which may more particularly be noticed the meadow pipit and skylark, which are constantly observed to arrive in considerable numbers. They travel in flocks, which vary in numbers from two or three to fifty, arriving commonly with easterly and north-easterly winds, and flying rather high in calm, and low in stormy weather. They are observed at all times of the day, and their movements are also well-known to take place by night, as they are disturbed at day-break in flocks upon the shore, and we have repeatedly observed their arrival at a very early hour of the morning. We may add that they sometimes come in contact with the floating-lights which are placed at various parts of the coast. The gold-crest and the kingfisher also belong to this division, the migration of the latter taking place somewhat earlier in the season than is the case with most of the other species.

We can say nothing as to the corresponding departure in spring of any of these species, but it is highly probable that their movements, being in a great measure nocturnal, may take place at that season unobserved.

Some species of resident birds appear to be subject to short inland migrations, but our knowledge of these being very limited, we have not thought fit to include them in the above analysis, but shall content ourselves with a short notice of them in this place.

Amongst them are several species of the finch tribe and the song-thrush, and by close observation others might doubtless be detected. It is remarkable that the latter bird, whose migrations in this country thus appear to be of the least decided nature, should in several parts of the continent be a regular migrant, for we find it mentioned by M. Deby (Zool. 861) as a bird of regular double passage through Belgium, and it is stated by M. Douval-Jouve (Zool. 1118) to be the bird of passage *par excellence* in Provence. We suspect that it is also an autumnal migrant, though not in large numbers, to the coast of Norfolk, and it is so mentioned by Sir Thomas Browne.

Before dismissing the subject of the resident birds, it may be remarked that while the preservation of game has tended to diminish the

numbers of the Raptores, especially of those which nest in the district, the same cause has greatly increased the numbers of the smaller species of perchers, which find in the extensive covers a safe retreat from the depredations of birds of prey, and from the still more mischievous attacks of bird's-nesting boys.

The closer weeding of the fields, consequent upon agricultural improvements, has interfered a little with some of the ground-nesting birds, but this probably does not apply to many species.

Of the regular migratory birds of Norfolk, those which arrive in spring, nest in the county and depart in autumn, are thirty-three in number, nearly half of them belonging to the family of the Sylviadæ. With the exception of certain species which also visit us in spring, but proceed to more northern breeding places, these are perhaps more regular in their appearance than birds of any other class. We believe that they also travel in small flocks, and chiefly during the night. The *Hirundinidæ* are well-known to congregate before departure, and we have observed the sand-martins to collect on the coast in immense flocks previous to their autumnal migration, the beach appearing at a short distance perfectly black with their numbers.

The line of division between the winter residents, and those birds which annually pass through this district in spring, on their passage to, and in autumn on their return from, their breeding places, cannot be permanently drawn with correctness, inasmuch as the movements of these divisions depend much upon the temperature, and perhaps in some measure on the prevailing winds of the particular season; and that, not so much in our own, as in more northern latitudes. Amongst the autumnal migrants to our coasts, the occasional irregularity in the numbers of the common buzzard, and still more in those of the rough-legged buzzard, are curious and worthy of especial attention. These birds are both regular visitors, but not in large numbers. In the autumn of 1839, the latter species was unusually plentiful, and we had an opportunity of observing that the same migration extended over part of Germany; which makes it probable that the birds came from a considerable distance, and that their appearance was not attributable to their having been driven from their usual route by any accidental cause. In the autumn of 1845 on the contrary, the rough-legged buzzard was hardly seen, whilst the deficiency was to a certain extent counterbalanced by an increased influx of the common species. These variations are at present unaccountable, as we can neither connect them with change of temperature, nor with any deficiency

or superabundance of food, although it is probable that by such causes their movements are influenced.

Not the least curious point in the migrations, both of these and the other species of the falcon tribe, is the fact, that birds, at other seasons so much the reverse of gregarious, should to a certain extent migrate in company. That they actually do so, we have indeed no certain evidence, but their simultaneous appearance along a line of coast would seem to indicate it, and the rough-legged buzzard has certainly been observed in pairs in the autumn. Some of these visitors indeed, are birds of the previous breeding season which have never been fixed in any particular locality, but very many, though they have not entirely assumed the adult plumage, are birds of the second or third year, whose gregarious nature at this season may be considered as at variance with the usual habits of the genus.

There are several other species of this class which are observed to congregate either previous to, or at the time of their flight. We have repeatedly noticed this habit in the hooded crows, which just before their departure in spring may be seen gathered in small parties under the sandhills on the coast. These assemblages gradually become larger, until the birds of which they are composed suddenly disappear, and it may be conjectured that they collect in this manner for the purpose of settling the period and direction of their flight.

"Where the Rhine loses his majestic force
In Belgian plains, won from the raging deep,
* * * * *
* * * * *

The stork assembly meets ; for many a day,
Consulting deep, and various, ere they take
Their arduous voyage through the liquid sky."

THOMSON.

Yet the hooded crow is, we think, not gregarious in its autumnal migration to our coast, as we have seen solitary specimens before the arrival of the main body, and have also seen it arrive singly.

A large proportion of the wading and swimming birds which are found in this district will be seen by the analysis to be included in the two classes of migrants under consideration. It is highly probable that many of these formerly came under the denomination of summer visitants, and bred regularly in the county, and more than one instance is mentioned in the Catalogue, in which, even at the present day, birds of these divisions have been killed under circumstances which

made it appear, that had they been unmolested they would have remained through the summer for the purpose of nesting.

To the improved system of draining, and the general use of the gun, combined with the indiscriminate system of egg-collecting which has been in some parts long carried on, may be attributed the great decrease in the number of water-birds which breed in Norfolk. The same causes have, although in a comparatively trifling degree, lessened the number of winter migrants; but the decrease of the latter is apt to be exaggerated, from the circumstance, that the number of fowl taken in the decoys is much smaller than formerly; which may be more correctly attributed to the noise and additional destruction caused by the increased use of fire-arms, than to any great diminution in the actual number of the birds which visit the district at that season.

The punctuality with which many of the birds of double passage, whether of regular or only of occasional appearance, arrive on the coast, both in spring and autumn, is remarkable.

Being hastened on in the former season, as well by the migratory impulse, as by the near approach of the season of reproduction, they then remain with us no longer than is sufficient to insure the supply of food and rest necessary to enable them to continue their journey across the sea. Many species are also observed at that season especially, to pursue a more direct course to their destination, by crossing the land, instead of, as in autumn, following the line of coast.

These overland flights are principally, in fact almost exclusively, nocturnal; in illustration of which, it may be mentioned that a pochard duck has been known to dash at night through the window of an upper room in the middle of the city of Norwich, in which there chanced to be a light. It also frequently happens that short-eared owls, snipes, golden plovers, and other birds are killed in these nocturnal movements, by flying against the wires of the electric telegraph on the line of railway, as well near Norwich, as in the vicinity of the coast; and we once saw a bird of the latter kind which was found alive near the railway in the morning, with one wing completely amputated close to the body, by the same means.

In autumn, or rather at the end of summer, the earliest visitors are the most punctual in their appearance; they come at first in small flocks, consisting chiefly of the young of the previous spring; and we suspect from their tameness, and the fatigue which they exhibit on their first arrival that they are birds which have crossed the sea, and that the later arrivals are those which come down the coast. We have

seen them at this early part of the migratory season, asleep on the beach, and even when disturbed, very unwilling to move.

As the winter approaches, older birds appear and in larger flocks, and if severe weather should set in, their numbers are occasionally enormous. As an instance of this, it may be mentioned that on the 11th of December, 1844, there were brought to a dealer at Yarmouth upwards of 800 dunlins and 500 snipes, and on the 16th of the same month 200 dunlins and 300 snipes, besides many other birds of different species; and a similar extraordinary appearance of wild fowl is mentioned by the Messrs Paget in the 'Sketch of the Natural History of Yarmouth,' to have occurred in the year 1829.

We have also more than once, towards the end of autumn, observed the sea within a quarter of a mile of the shore, to be covered with an almost incredible quantity of fowl floating in an extended line. On one of these occasions when the water was very smooth, we observed that the foremost birds of the flock suddenly rise, as soon as they were drifted by the tides into the ripple caused by a neighbouring sand, their example being immediately followed by those in the rear, when the whole assemblage would fly back to the distance of about half-a-mile, and again settle on the water, repeating the manœuvre as often as the tide carried them to the point from which they had risen.

The various species of gulls are more common at these than at any other seasons of the year. From their aquatic habits, and the nature of their food, it is difficult to attain a thorough knowledge of their numbers, and that part of the Catalogue in which they are comprised, may consequently be considered as the most imperfect.

The species of which we have hitherto spoken, although differing from one another in many points, are yet alike in this respect, that their migrations are, with the few exceptions which we have mentioned, regular, and ascertained.

It remains to notice a class of birds whose movements are extremely uncertain, but which, nevertheless, form a large proportion of the birds of Norfolk, being about eighty in number.

Under the head of the regular migrants, we have already referred to the occasional uncertainty attending the movements of the common and rough-legged buzzards, and also to the supposed gregarious nature of their migrations. The same remarks may, in a great measure, be applied to the honey-buzzard, which however, is a much rarer, and even somewhat more uncertain visiter: like the rough-legged buzzard it has been observed in pairs in the autumn, and it seldom occurs in an adult state, but the birds found are by no means

of the same age, as was very apparent in the specimens killed in 1841, which were in almost all the stages of immature plumage. It is, therefore probable, that the irregular movements of certain species, both of the Falconidæ and other families, are totally independent of the cause which we have suggested in the Catalogue, in speaking of the white-tailed eagle.

Most of our rare herons and sandpipers are included in this class of migrants, but they appear in most cases singly, though commonly with little variation as to time.

The appearance of the eared grebe, which is mentioned in the Catalogue as having lately occurred, is another example of those irregular movements, the immediate cause of which can be only conjectured. That they are sometimes, as in the case of the little auk referred to in the Catalogue, and (more often) as the storm petrel, produced by sudden storms and similar accidents, is very probable; but we are inclined to consider this rather as the exception than the rule. It has been more than once recorded, and has probably happened much more frequently than has been noticed, that the appearance of some species of birds, at other times rare, has been simultaneous with an unusual abundance of the particular food by which those species are maintained. Four remarkable instances of this may be mentioned, viz. the appearance of the crossbill in the years 1254 and 1593,* and of an owl, supposed by Montagu to be the scops-eared owl in 1580 and 1648,† and it is not improbable that to a similar cause, might be traced the migration of the nutcracker into Belgium in the autumn of 1844, and many other irregular and (so-called) accidental migrations. It may be objected that examples such as we have mentioned are both few and far between, but it is to be remembered that such occurrences, even at the present time, are seldom noticed, and that they were so in these instances probably, only because the arrival of the owls proved the destruction of a great nuisance and prevented much damage, and because in both cases, the unusual appearance and colour of the visitors, would especially make the circumstance to be remembered.

In conclusion, it may be supposed that many birds which thus appear amongst us, are either travelling *towards* certain localities where a temporary superabundance of that which is their natural food, would unless thus controlled, destroy the balance of some other part of the

* 'Yarrell's British Birds.'

† 'Montagu's Ornithological Dictionary,' art. Little Horned Owl.

animal or vegetable creation, or *from* places where their own presence in too great numbers would work a similar injury. We may further suggest that the former class is represented by those birds which appear in flocks, and the latter, by those which disperse in various directions, and which are consequently only found amongst us, singly, or in flocks of very limited extent.

By such "nice links and beautiful dependencies," are the various subordinate parts of the whole system of creation connected !

J. H. GURNEY,
W. R. FISHER.

London, June 3rd, 1846.

ERRATUM :

At page 1319, the 13th line from the bottom, for "*northern* " read "*southern*."

The peculiarity in the mode of a Robin's capturing its prey.—On the 28th ult. when out entomologizing, I was much amused in witnessing what appeared to me the novel manner in which a robin captured its prey. The bird was two yards distant from me perched on a paling, which it several times left to dart upon some flies it had seen on the trunk of an oak, which it managed rather dexterously to ascend, and always succeeded in capturing the insects, which were devoured upon its return to the palings. Not recollecting to have seen this fact mentioned in any ornithological work which I have read, I am induced to send you this notice, trusting it may find a place in your magazine, if deemed worthy of insertion.—*E. J. R. Hughes ; Catherine Street, Whitehaven, June 9th, 1846.*

Occurrence of the Nightingale in Devonshire.—A nightingale was shot a few days since at Tallaton, near Honiton, and is now in the possession of Sir John Kennaway, Bart. Notice of this circumstance in the 'Zoologist' will oblige.—*Edward Murch ; Honiton, Devon, May 21st, 1846.*

The Oil-gland again.—The 14th ult. I took three ravens from a nest on Dartmoor ; they are coming on finely, and the most forward bird is frequently pressing a vast gland with his iron beak, extracting therefrom an oily matter, and spreading it on his feathers. It seems to me that a liquor comes from his throat, and mixes with whatever he may get from the gland ; just as when we put any pungent substance on our tongue, when the saliva will flow freely. I cannot be persuaded but that birds lubricate.—*Henry Daniell ; Exeter, April 26th, 1846.*

[I fear this communication aims at proving too much : it appears to me rather going too far to imagine that birds will with their beaks press a gland in order to express a pungent oil, which pungent oil is to serve for the purpose of causing a flow of saliva, and this saliva again to serve for the purpose of lubricating the plumage.—*Edward Newman*].

Note on Mis-coloured Eggs.—Those who collect the eggs of birds, well know how different the colour and markings are in different specimens of the same bird. During the summer I found a nest in some ivy, containing some milk-white eggs ; on revisit-

ing it, I found it to be a robin's, as the old bird was sitting; I saw the young birds also after they were hatched. In a house-sparrow's nest, among three eggs marked as usual, I found one with the spots of a light red colour, in every other respect it resembled the rest.—*J. F. Streatfield; Chart's Edge, near Westerham.*

Note on Cuckoos.—These birds have been very numerous here throughout the summer: their eggs were found in several nests. In one nest (a titlark's) I found one half-fledged, which I took, to bring up by hand. It was very spiteful, spreading its wings and flying at my finger when offered. During a month it was fed on hard eggs, butterflies, grasshoppers, &c. It now fed itself, and never seemed to have enough food: one day it ate sixty-five butterflies (principally meadow browns) and a whole hen's egg. It lived till winter came on, when it died, without any apparent cause. I obtained one of the eggs, and in another titlark's nest found a young cuckoo, which quite filled the small nest and had turned out the egg and young one of the titlark.—*J. F. Streatfield; Chart's Edge, near Westerham.*

Notice of the occurrence of the Virginian Colin in Surrey, and of the Broad-billed Sandpiper and Red-necked Phalarope, in Sussex.—I have lately seen a fine adult male specimen, in the most perfect plumage, of the *Perdix Virginiana*, which was shot near Chelsham Court, Godstone, Surrey, by the bailiff of Mr. Brown, of Chelsham Court. I had a long conversation with the bailiff, who informed me, that the bird had been heard, and occasionally seen, during two or three months, but that owing to its great powers of ventriloquism, and the difficulty of flushing it, it was not till the middle of October, 1845, that he succeeded in shooting it. The bird rose from a broad hedge-row, with underwood and timber (which we in Sussex call a "Shaw"), whilst he was beating with some spaniels for a cock pheasant which had been marked down there. It flew very straight and very swiftly; something in the manner of the kingfisher. The note was described to me as consisting of *two short, low whistles*, followed by one *long, loud, and shrill*; thus reminding one of a converse to the note which has obtained for the common quail the significant specific title of *dactylisonans*. It has been suggested to me by Mr. Yarrell, and I think with great probability, that the specimen under consideration belonged to a number turned out near Windsor, by Prince Albert, and which had been obtained in North America. A specimen of the broad-billed sandpiper (the *Tringa platyrhyncha*, of Gould) was shot on the beach, near Shoreham, Sussex, at the latter end of October, 1845. When shot, it was feeding amongst a small flock of the purre (*Tringa variabilis*). This specimen is in pure winter plumage, with the exception of one scapular feather and a small patch on the occiput. It is now in my possession. About the second week in September, 1845, a male red-necked phalarope (Red Lobe-foot of Jenyns's *Brit. Vert. An.*) was shot on a small pond of fresh water, near Old Shoreham, Sussex. This is in the pure winter plumage. On the 20th of May, 1846, another specimen of this bird was shot, also on a pool of fresh water in a valley of the South Downs, near Falmer, to the north-east of Brighton: the ovary contained eggs in an advanced stage. This is in the perfect breeding-plumage, and on dissection proved to be a female; it had been driven in by some severe south-west gales. It was very tame, and was constantly nodding its head, and dipping its bill in the water.—*W. Borrer, Jun.*

Occurrence of the White Stork near Fermoy, and Note of the Herring-gull breeding in confinement.—A fine specimen of the white stork (*Ciconia alba*, Ray), was shot about three weeks since in the neighbourhood of Fermoy, in the county of Cork. I am informed that three were seen, but this individual only was procured. It is now in the

possession of the Rev. Mr. Bradshaw, of this city. I am not aware of any authentic record of this species having been met with in Ireland before. Whilst on the subject of birds, I may mention an occurrence which, though rare, is not without precedent. My friend Robert Parker, Esq., of Carrigrohan, in this neighbourhood, has had a pair of herring-gulls (*L. argentatus*, Linn.) in confinement since they were taken from the nest, now three or four years. They have built near a pond in his garden, and are now hatching: there were two eggs when I saw them. When any one approaches the nest, the bird which is not sitting immediately comes to the assistance and defence of its mate. They are in beautiful plumage, adult, with the exception of a little mottling which remains about the flanks.—*J. R. Harvey, M.D., St. Patrick's Place, Cork, June 17th, 1846.*

Further remarks on the submergence of Water-birds.—The June number of the 'Zoologist' has just been forwarded to me, and I have perused and reperused Mr. Slaney's 'Further Notes, &c.' (Zool. 1369). I am sorry to revert to the "trite subject" again; and sorry on many accounts: but I feel myself almost compelled to do so by the appearance of these 'Further Notes.' I will first advert to two or three misconceptions or inaccuracies on the part of Mr. Slaney. In the 'Zoologist' (Zool. 1370), I find him saying, "But how does this 'cordial agreement' in any way bear out what Mr. Atkinson has *before asserted to be the fact* (Zool. 498), viz., 'that no moorhen—that no bird whatever, indeed, could put itself into this posture, and retain it independently of external assistance.'" And again (Zool. 1371), "Mr. Atkinson *also stated* (Zool. 498) that *no bird whatever* indeed could put itself into this position, &c."

Now, my words are, "*I apprehend* that no moorhen,—that no bird whatever, &c.:" words, which, as I think, scarcely "assert" a "fact," or convey a "statement," except of opinion or conjecture. Again (Zool. 1371), I find the words, "His (Mr. A's.) observations on decayed weeds sinking and remaining at the bottom, so as *there to afford a hold* to the moorhen's feet, &c." Now, my "observation" is (Zool. 1326) "so long as they (the weeds) *stand*, if I may use the phrase, I think they would be sufficiently strong to hold the moorhen down; and *when fallen*, they would be *out of the moorhen's reach*;" an observation, I think, which scarcely involves the statement that "decayed weeds," "having" fallen to the bottom, "there afford a hold to the moorhen's feet." Further, when I wrote as follows (Zool. 498), "The bill was *first* thrust higher out of the water, *then* followed the head as far as the eyes, and *then* the whole head. Careful glances were thrown around, and if all remained quiet the whole bird *presently* reappeared, &c.;" when I wrote thus, I had imagined I was describing, not a "posture," but a *change* of posture; which moreover I had termed, in the next preceding sentence but one, the bird's *emergence*. I imagined I was describing a "posture" and "*the state of submergence*," when I said "the bird remains submerged, with *merely its beak thrust out* for the purpose of respiration." And I certainly took the very earliest opportunity of placing beyond all doubt what I did mean to describe; when, in my reply to Mr. Slaney's strictures (by him received as "severe," not so intended by me), I penned the second paragraph (Zool. 756); and in the third paragraph on the next page, said "I apprehend that no moorhen,—that no bird whatever, indeed,—could put itself into this posture (*of submergence, namely*) &c." Of my notes, (Zool. 498) one paragraph, in the *MSS.* terminated at "search after food:" and of course, the next sentence commenced another, in which I pass on to another division of my subject. In it I state my opinion "that no moorhen,—that no bird whatever, indeed,—could put itself into this posture (*of submergence, namely*) and *retain* it independently of external assist-

ance. The sentence "that no bird whatever, indeed" was intended to be parenthetical. And in the following sentences, viz. "The feet are the instruments, &c." I speak *only* of the moorhen; as I think must be apparent on the most cursory perusal, for no one ever would think I could speak of the *duck's* foot, for example, as tenacious of grasp. In these sentences I certainly do state as a fact, the result of observation, not "that the feet of the moorhen are, beyond question, the instruments by which it holds itself down," but that I have seen their feet apparently employed for that purpose; forasmuch as I have seen their feet when submerged, grasping weeds or flags, (I mention one in particular); and that when I have shot them so submerged ("in their concealment" are my words), they have still, on coming to the surface dead, retained fragments of the weeds in the grasp of their toes. It was, and still is, my very decided opinion, my conviction, that the moorhen does use its feet as instruments to hold itself down by. And in the passage in question, it was my intention to convey this conviction, and to give the grounds on which, so far as observation went, I had formed it. I am free to admit that my sentences might have been more accurately constructed; but I expected no criticism; and, as soon as I could, tried to supply any defects which there might be in them: and I think that common attention was all that was required to apprehend their meaning. Mr. Slaney (Zool. 1371) says "The term 'hypothetical' which Mr. Atkinson seems to quarrel with, was used by me, because I did not find in Mr. Atkinson's previous statement anything that warranted me in believing he wished it to be understood, he actually *had* either seen, or shot, a moorhen while submerged *and* holding on by its feet to the weeds to keep itself down." As I have just said, I think my words were quite sufficient to express "my wish to be understood;" and in my reply to Mr. Slaney's first notes I made that wish quite evident by writing (Zool. 757) "I must take the liberty to remind him (Mr. S.) that I do not give my 'explanation' as a theory, but as the result of close and repeated observation. *I have again and again seen the feet of the moorhen holding on by weeds or flags.*" And yet, in the 'Further Notes,' Mr. Slaney writes "But in the last (May) number, Mr. Atkinson states unequivocally the fact of his having seen and shot moorhens so submerged, and while, &c." Now, from the preceding extract it is apparent that I made the "unequivocal statement" in question some *eighteen months before the appearance of the May number*; and I therefore think it hardly fair in Mr. Slaney to write as though it were only made for the first time in the May number. Mr. Slaney's comment on the statement so made in the November number for 1844, and repeated in the May number for 1846, is, "This, I confess, * * surprises me not a little." I am somewhat at a loss to account for Mr. Slaney's surprise here. Is it surprise at the "unequivocal statement" of the fact; or at the fact "unequivocally stated?" I think it is eighteen months too late for mere surprise at either; that there need be no surprise at the statement of the fact; and that surprise at the fact ought to be attended with something else than a mere expression of surprise. Moreover, "the six reasons" I "beg" Mr. Slaney "to consider," together with the (inaccurate) view of my observations on decayed weeds, already noticed, also "surprise" Mr. Slaney "not a little;" at least I suppose this is the meaning of the sentence, for the verb "surprises" is singular, as his notes are printed. But I cannot help thinking that both facts, and arguments if not preposterously absurd, in controversy, merit something more than mere expressions of surprise. Let the facts be weighed, and the arguments, if fallacious or ill-constructed, be controverted or exposed. Mr. Slaney says (Zool. 1370) "There are to me, many other startling circumstances in Mr. Atkinson's last observations, which I am desirous to consider, but which

I do not think apply to the matter in question ;” and in the ‘Zoologist’ (Zool. 1371) he expresses “not a little surprise.” I think I may be permitted to be at least a *little* surprised that Mr. Slaney does not even attempt to reply to any one of my arguments, nor condescend to say which those are that “do not apply to the matter in question,” and why they do not apply ; nor vouchsafe any notice, save surprise, to my facts ;—supposing, *i. e.*, the surprise excited by the facts, and not by the statement. On the whole, I think my remarks concerning posture and change of posture, will be sufficient to show on what slight grounds Mr. Slaney has built his ingenious defence of his misapprehension of my remarks ; which misapprehension, moreover, he adheres to still, though I strove to remove it eighteen months ago. He himself (Zool. 1369), calls that a “reappearance” which he calls a “posture” a few sentences after : now, “reappearance” implies *motion* ; but “posture,” I think, implies rest. And therefore, Mr. Slaney, knowing I was describing a *reappearance*, ought scarcely to have made me out to be describing a *posture* ; especially when “the state of submergence” was so clearly defined a few lines above. It is, perhaps, scarcely necessary to remark, that supposing the moorhen *holds* itself submerged, or all covered by the water but its beak ; I suppose also when it begins, and as it continues, its gradual reappearance, it still retains its hold on the objects of its grasp. My idea of partial submergence is given in the ‘Zoologist’ (Zool. 500), in describing the habits of the dabchick, and repeated at the bottom of page 756 ; and I think that this definition ought to have been sufficient to prevent any confusion in Mr. Slaney’s mind between that state in which almost all water-birds may very frequently be seen, and the manner in which the moorhen leaves the concealment it has sought in submergence. The moorhen unquestionably has the power of *partial submergence* in common with the multitude of water-fowl, and in that state makes, as Mr. Slaney has observed it doing, the same use of its feet as they of theirs. And when Mr. Slaney states this, I do “cordially agree” with him ; still this, my cordial agreement, is in no way inconsistent with my belief that no moorhen, nor yet any other bird, can maintain that posture in which “no part of the body, but the beak only is left out of water,” (Zool. 500), exclusively of external assistance. And here I would repeat a question I have before asked (Zool. 757), “Did Mr. Slaney ever actually detect a moorhen, or any individual of ‘the various classes of water-fowl,’ so submerged in ‘deep water’ and where there were no weeds or flags whatever near the surface ?” “So submerged” meaning, *so covered by the water that only the beak is out of the water*. There is one part of Mr. Slaney’s ‘Further Notes,’ beginning “But after Mr. A.’s admission, &c.,” which I do not clearly understand. I particularly refer to the passage, “I am the more puzzled to know, where the line is to be drawn, and at what particular depth such power is required ; supposing the head and all parts of the bird’s body to be under water.” Now in every paper of mine I have referred to the circumstance that the submerged moorhen’s beak is above water. A moorhen cannot of course dive, or submerge itself, unless the water be sufficiently deep to admit of it. And if sufficiently deep, it matters not, as it seems to me, whether it be only just sufficiently deep, or deep enough to cover a mountain instead of a moorhen. A moorhen submerged, is as much submerged in one foot of water, as in fifty, or five hundred. I do not, therefore, understand what is meant by the phrase “at what particular depth, &c.” May I ask, has Mr. Slaney well considered the form of the first question he has referred to Messrs. Yarrell, T. C. Eyton, and Sir W. Jardine ; viz., “Do the moorhen and other aquatic birds when alarmed descend to the bottom of the water and there remain submerged and in a quiescent state ?” I should think that the question con-

tained an oversight, did I not notice, nearly at the bottom of the preceding page, the expression "acquire the power of *going straight to the bottom* of the water." Does Mr. Slaney then contend that aquatic birds can "descend to the bottom of the water," irrespective too of its depth, and "there remain submerged and in a quiescent state?" If not, since I have said nothing at all implying any such idea, but the very contrary, I hardly know why the question is put in such a form. I think Mr. Slaney's suggestion that the question be referred to such parties as those named by him, a very good one, only let it be put in a proper way. Let what is meant by submergence be clearly defined; as, *e.g.*, a bird is *submerged* when, being in a state of rest, it is completely covered by the water, all but its bill so far as the nostrils; and a bird is partially submerged when swimming with "the head and neck," or with the "head and neck and part of the back" out of the water. And let the questions be, "Are certain aquatic birds ever in the habit of submerging themselves, and remaining submerged for a given length of time? If the answer be yes, as I know it must be, let the next question be, "*What* birds have such habits?" If the answer to this be, as I conceive it will, "Of our English birds, the coot and moorhen, occasionally the dabchick, if not other grebes; and the *young* of perhaps most kinds of water-birds;" let the next question be, "Where, and by what means, do they maintain this position?" And I think the answer will be, "Only where there are weeds, and by means of external assistance. The *moorhen* and the coot by means of their feet grasping the weeds; the others by wedging themselves in (so to speak) among weeds sufficiently dense and strong to keep them down." In conclusion, I am quite as willing as Mr. Slaney that our controversy should be settled. I have no intention to write on it again. I am sorry it should have worn another appearance than that of amicable controversy. I am convinced that ten minutes' talk would remove much of the apparent difference between us; and if he should ever visit this very pleasant watering place, and will honour me by a visit, I shall be most truly happy to see him, and to compare notes with him in many another matter save that of the moorhen's submergence. — *J. C. Atkinson*; 7, *Belvoir Terrace, Scarborough, June 2nd, 1846.*

[I hope this discussion may now be allowed to drop: I think its interest to naturalists has ceased, since *their* object is to know what birds do, not what Messrs. Slaney and Atkinson have said of their doings, and this seems *now* to constitute the subject-matter of the discussion.—*Edward Newman*].

P.S.—This memorandum was omitted by mere accident last month; it was written as an appendage to Mr. Slaney's paper, and seems as much required now as then.—*E. N.*

NATURALIST'S CALENDAR FOR JULY.

BIRDS.—The old cuckoos mostly leave us in this month, but the young birds frequently remain till late in September. Cuckoos are very fond of the caterpillars of the burnet-moths (*Zygænæ*), and several may frequently be seen together searching for them in fields where these insects abound.

INSECTS.—The beautiful purple emperor butterfly (*Apatura Iris*) appears about the middle of this month, and may be met with in woods where aspens and willows abound, soaring round the highest trees, and not unfrequently coming down and alighting on wet, muddy spots, where it may readily be captured. It is plentiful in

Monk's Wood, Hunts, in many of the woods round Colchester, and in the wood on Mersea Island, Essex. The blue and black hair-streak butterflies (*Thecla quercus*, and *W. album*) are now on the wing, and the marbled white (*Arge Galathea*) is sometimes to be found in great profusion, but is very local. The comma butterfly (*Vanessa C. album*) which has nearly disappeared round London, is still common in many places; in Monk's Wood it may be met with in plenty in this month, and the specimens which occur at this time of the year are much paler in colour than those found in September. Many moths now appear: among them the beautiful *Thyatira derasa*, *Triphæna fimbria*, *T. janthina*, and *T. interjecta*, several of the genus *Graphiphora*, and many *Geometræ*. Among these the beautiful and variable orange moth (*Angerona prunaria*) may be seen flying in open places in woods, at or a little before sunset.—*Henry Doubleday; Naturalist's Almanack for 1845.*

Egg laid by a Tortoise.—There have been three tortoises in the kitchen-garden here for some time, one of them for three years, and the other two a shorter time. This winter they all three died, which is strange, as it has been so mild a winter. But what I wish to mention is, that some little time ago, the gardener picked up a round white egg, which he thought was a tortoise-egg, but which we could not prove certainly to be so, though not knowing what else it could be; but a few days ago he lifted up the dead body of one off a heap of rubbish where it had been thrown, and which was a mass of decomposed matter, the shell only being sufficiently entire to lift it up by. Amongst the dirt, small bones of the skeleton, &c. inside the shell we saw something white (for I was present), and on routing it out it proved to be a second egg, precisely like the one first found, and putting it beyond a doubt that it was also a tortoise's. This confirms what Mr. Bell suggests in his 'British Reptiles,' that there are many of the foreign land and river tortoises that might be naturalized in Great Britain with a little care. These were left always to shift for themselves the short time we had them, the one that had been here three winters buried itself always during the winter, not appearing till the fine weather came in the spring. They lived on the young lettuces and other things, and in the summer were not seen sometimes for a week at a time, when the garden was thickly planted. The eggs are about the size of those of a pigeon, but round, and apparently with a very thick and hard shell. This winter being so mild, they had not buried themselves sufficiently deep, or had been tempted to come out of their hiding-places too soon, I suppose; or whether being so mild, insects were at work and attacked them, I don't know; but I have been away from home all the winter, and could not therefore see them when they first died, to try and trace the cause of their death. It is curious that though in other winters they should be sufficiently aware of the season, as to prepare for it by burying themselves, that this winter they should have changed their custom so entirely as to think of the reproduction of the species.—*J. W. G. Spicer; Esher Place, April 18th, 1846.*

Eggs found in a Tortoise.—I have kept a tortoise for twenty-four months in a garden alone. On Saturday the 2nd instant it died, and on a post mortem examination, was found to contain five eggs of a white colour, and strong shell, besides a lot of imperfect affairs such as a hen shows sometimes.—*Henry Newman; Birmingham.*

Notes on the Fishes of the District of the Land's End.

By R. Q. COUCH, Esq., M.R.C.S.E.

HAVING read with much pleasure the papers on the habits and migrations of birds, lately inserted in the 'Zoologist,' I readily comply with your wishes of recording in the same work a few reminiscences of the fishes on the Cornish shores. These notices cannot be so full as those of your ornithological correspondents, since they refer to creatures removed from the constant observation of man, while theirs refer to such as may be seen in their daily occupations and pleasures. But though not so full, they may, I hope, be at least interesting, since if little be said, it will be on a subject which cannot be commonly studied, and of which not very much is known.

Mr. Yarrell's valuable work on British Fishes has given an impetus to the investigation, and supplied us with most that was known up to the time of its publication. The following notices are the results, either of personal observation, given on the authority of the fishermen, or such persons who, from habits of observation, can be relied on. It is not intended to give a systematic account of each species, but merely to refer to their habits, migrations, and such facts as may be either new or confirmatory of Mr. Yarrell's text, with occasional traits of their personal biography. If such a plan meets your approbation, it is the one that shall be pursued in the following pages.

Bass, *Perca labrax*. This is a common fish in Mount's Bay, and in the sandy nooks round the Land's End to St. Ives' Bay. It is with spawn about July and August. When young, it congregates in large companies, which roam about from spot to spot, especially on the sandy ground found at the entrances to rivers: when large, it is solitary and fond of prowling among low rocks. It takes a bait freely; its favourite food is minute Crustacea, in search of which, it ventures almost to the margin of the tide, and high up rivers.

Smooth Serranus, *Serranus Cabrilla*. Common, though not abundant, among the low rocks, called by the fishermen "rough ground," in moderately deep water; it is frequently caught in crab-pots, and is used by the crabbers as bait; it does not wander much; it is in spawn during the summer months; it takes a bait readily, but is in no estimation as food. There is a remarkable peculiarity in this fish, that it always dies in the most severe spasms; its dorsal, caudal, and anal fins become expanded to their full extent, and are preternaturally erected, and in this state they remain till destroyed by decomposition.

Dusky Serranus, *Serranus gigas*. The late Mr. E. Chirgwin informed me that two specimens have been caught in Mount's Bay.

Couch's Polyprion, *Polyprion cernum*. This is always called by the Cornish fishermen, either the Stone Bass or Wreck Fish. This can hardly be called a common fish, though it is by no means rare; for several years not a single specimen can be seen, and in one winter they may become abundant. Their habits generally confine them to deep water, far off the shores: the fishermen of Mount's Bay inform me, that they frequently see them W. and S.W. of the Scilly Islands, about five or ten leagues from land, sporting about floating pieces of wood, especially if covered with barnacles. If these floating pieces of wreck are driven near the shore these fish follow them in flocks, gamboling about from side to side, or leaping over them: it has been supposed that they follow the floating wood to prey on the small fish that take shelter beneath. That they devour such creatures, there can be no doubt, but it can hardly be the case, that this is the *object* of pursuit, since they are frequently so numerous, that such a supply would be speedily exhausted: to all appearance it is mere sport. They were common last winter in the sheet of water between the Scilly Islands and the Land's End. They sometimes grow very large, so much as twenty-eight pounds; Cuvier, however, mentions a hundred pounds as an occasional weight.

Great Weever, *Trachinus draco*. This beautifully tinted fish resides on our coasts throughout the year. In the summer it is caught in the sandy bays where the pilchard fishing is carried on. From the fishermen's account of it, it is rather an inactive species; it burrows in the sand, and is frequently caught with the tuck-nets of the pilchard seine. Its colours when living are remarkably brilliant; the stripes of yellow, brown, blue, &c. gently wave from the back in an oblique direction backwards, and near the abdomen change to a yellow and white; the stripes being definite, give a remarkably brilliant appearance to the whole. But though so beautiful in colouring, it is rather a dangerous fish to handle in a living state. On the gill-cover, or each side of the head is a long sharp spine, pointing posteriorly: this is the weapon both of offence and defence, with which it unerringly strikes a blow. A puncture from these spines is a poisonous one, the pain is great and rapidly extends from the hand to the shoulder, the injured part soon turns to a livid purple colour and swells very much. A few months ago, I saw one which had just been caught, and as it lay in the bottom of the boat, I frequently threw some sea-water over it to keep it living, and then irritated it with a stick,

but whichever part of the body I touched, it unerringly struck with its spines, by bending the body and throwing its head back with a rapid jerk. If a person should be unfortunate enough to be stung, the best application is to rub into it equal parts of the tincture of opium and olive oil.

Lesser Weever, *Trachinus vipera*. This fish I have caught near Hayle, as it lay in the wet sand. It is smaller and more active than the last-named species, and as it is equally well-armed, I suppose it is a more dangerous fish to handle: my specimen I killed before I took it up. This fish, like all others which burrow in the sand, or use the tail as a prehensile organ, has a pulsating sac about the root of the caudal fin, from which blood is specially forwarded to all parts of that organ. This "heart" has been figured by Dr. M. Hall, in his work on the circulation, as it appears in the conger.

Surmullet, *Mullus surmuletus*. In the district of the Land's End this is a rare species, and those that occur are not so large as in the eastern part of the county. In the winter it goes into deep water, while in the early part of summer it approaches the shores, entering our sandy creeks and up-rivers as far as the salt water rises. It prefers a hard, sandy bottom, with a few rocks. Its food is the minute Crustacea, and it breeds in the autumn.

The whole of the Gurnards are characterized by the hardness or bonyness of their cheeks.

The Red Gurnard, *Trigla cuculus*. This species is frequently called the "soldier," "cuckoo," "red ellick," "gaverick." It is generally of a bright red colour, but when in high season, is spotted with golden yellow. It is very common, and though not much sought after for the table, yet forms a very palatable dish. Its name of "cuckoo" is probably derived from the grunting sound it makes after it is captured, which somewhat resembles the sound of the notes of the bird of that name.

Sapphirine Gurnard, *T. hirundo*. Common at all seasons on rough ground: it is called by the Cornish fishermen "tubfish." This is the best as well as the largest of the British Gurnards, and is also the most brilliant. The pectoral fins, which are very large, and generally expanded when the fish is caught, are of a bright red, with azure-blue margins.

The Piper, *T. lyra*. Common in Mount St. Ives, at uncertain periods. The head is large, and the body tapers from it to the tail. This also makes a noise when caught.

Streaked Gurnard, *T. lineata*. This is rare, and very irregular

in its habits: it possesses the vagrant habits of all the others, in addition to a few peculiarities of its own. All the Gurnards live equally well in the depths of the sea and at the surface, and hence are frequently caught on sandy soils by the trawl nets, in mid-water by the hook, and I have known them enclosed by a pilchard seine in mistake for pilchards, and the present species will frequently start several feet into the air, so that it might be called the flying gurnard.

Gray Gurnard, *T. gurnardus*. This is the most common on the Cornish shores of all the British species. So common is it occasionally, that it is considered a pest by the hook-fishermen. I have seen a bushel sold for sixpence, and even at that price the quantity has been so great that they could not find a purchaser, and they were therefore carried away in carts for manure. This species, is generally of a gray or grayish brown colour, and about a foot or sixteen inches in length; yet I have seen a specimens which I could refer to no other species than the present, two feet, four inches long, and of a bright copper colour.

Bloch's Gurnard, *T. Blochii*. I have seen a single specimen of this species, caught in a trawl in Mount's Bay.

The Shining Gurnard, *T. lucerna*. The late Mr. E. Chirgwin informed me that he had seen a specimen of this fish, caught off Tol-Pedn-Penwith, near the Land's End.

The whole of the Gurnards take a bait readily, and feed on almost anything, yet their favourite food is small crustaceans. Their habits are wandering, hence they are sometimes abundant, and at others rare. They are most commonly to be found in about twenty fathoms of water, but frequently much nearer the shores. They spawn during the latter part of winter as a general rule, but some are caught in spawn about July and August. In examining the eyes of this genus, a small quadrangular muscle will be found to arise from the edge of the sclerotic, at the circumference of the iris, at its inferior or posterior margin, which passes obliquely upwards, forwards, and inwards, and is inserted into the inferior circumference of the lens near the canal of Petit. It is well supplied with nerves, and its action appears to be to draw the lens obliquely forwards and downwards. It is found in the Gadidæ and many other fish, and regulates the focus of vision.

Bullhead, *Cottus gobio*. Miller's thumb. Common in gently running streams.

Sea Scorpion, *C. scorpius*. Common in pools in harbours. When caught, it makes a croaking kind of noise, opens its gill-covers, and erects the spines of its head and stiffens its whole body, as if pre-

pared for a vigorous defence. The spines are covered with a skin or sheath, which the creature has a power of drawing from the points and leaving them bare. This fish will live a long time out of water, provided it be kept slightly wet, but soon dies on immersion in fresh water. Those fish that swim deeply, are able to retain life much longer than those that swim near the surface; and the former are more sluggish in their movements, and require less aërated water for respiration. The more active are surface-swimmers. The immersion in fresh water acts like a poison, death not resulting from any variation in the respirable quality of the water. If a sea-scorpion, after being taken from the sea, be constantly kept wet with salt-water, it will live for a considerable time, the gill-covers acting as if surrounded by water. If the gills be kept wet and the skin dry, the creature gets restless, croaks, the gills move more rapidly than before, and it then dies at an earlier period than when kept altogether moist. If the gills be wetted with fresh water well aërated, life is not so long retained, but the fish seems more active for a time, and dies at last in almost a state of plethora.

Rough-tailed Stickleback, *Gasterosteus trachurus*. Rare in consequence of their being no favourable localities for them, for they breed so rapidly that they soon overstock a pond. I am informed that they build nests of dried leaves and grass.

Fifteen-spined Stickleback, *Gasterosteus spinachia*. This is a pretty and remarkable species: it is common on all our shores in sheltered bays; in spring and summer it ventures into the open sea: it is very active and pugnacious, using the dorsal spines with effect on small fish with which it may engage. In the pools between tide-marks it may be seen either remaining balanced in the water under the shelter of some hanging sea-weed, prowling among the sand and rocks for the minute crustaceans on which it feeds, or carefully guarding its neatly stitched nest, hanging among the neighbouring rock. Its mouth is small, and snout long, from which it is enabled to take its prey from beneath stones, or in the crevices of the rocks, whether they be horizontal or perpendicular. It never takes a bait, and is very timid, unless when watching its young, when it becomes sometimes bold and fearless: it spawns about April and May. The description of the nest and eggs of this fish having already appeared in the pages of the 'Zoologist' (Zool. 795), it is unnecessary to repeat it. The nests are not uncommon, for one evening while wandering over the rocks of Mount's Bay with a friend, for the purpose of showing him one, we

found six in about a hundred yards. The young as they escape from the egg are unlike the adult.

Maigre, *Sciæna aquila*. This rare species has been taken by the Mousehole fishing-boats, and one was taken at Mevagissey in the autumn of 1843, which measured six feet in length, and weighed about 400lbs, and another in the winter of 1844 at Fowey, so that the fall of the year, appears to be the time of their visiting our shores. It feeds on Crustacea and sea-weed.

Becker, *Pagrus vulgaris*. Common during the summer and autumn. This is a powerful fish on the line: it frequents sandy bays and inlets, feeding on small Crustacea which abound in such situations: it has powerful jaws and good molar teeth: its colour is of a bright and beautiful red: it breeds in deep water, and keeps there till the warm weather of summer brings it into shallow water. This fish cannot breed so numerously as the next species, since they are never abundant, and the young are rarely seen.

Sea Bream, *Pagellus centrodontus*. This is the most common of the breams, and when living, is also one of the most brilliant. It frequents our bays in large schulls, and advances and retreats with the ebbing or flowing of the tide. It is caught by our fishermen in large quantities during the summer and autumn months: it is in low estimation for the table, but is much undervalued: it varies in price from $\frac{1}{2}$ d. to $1\frac{1}{2}$ d. each, but the latter is thought high. During winter it retires to deep water and there breeds; in the summer the young approach the shore in multitudes, and as they take bait readily, they afford excellent sport to the amateur fishermen. When young, they are called "chads," and are without the black lateral spot; when half-grown, they are called "boggers," and have the lateral spot small: they feed on Crustacea and sea-weed, as does also the becker. This fish frequently rises to the surface in moderately deep water, and moves slowly along as if in the act of migrating. A few years since a seine in Mount's Bay enclosed a schull, in such a position, mistaking them for pilchards, and found on examination that they had taken 60,000 bream. Mr. Yarrell in his 'British Fishes' has given a figure of a malformation of the head of this species, which is not of unfrequent occurrence. I saw four specimens of it last summer in the course of one week, and I have seen several others at other times.

Spanish Bream, *S. erythrinus*. Several are generally caught every year on the shores of Mount's Bay.

Old Wife, *Cantharus griseus*. This is called the black bream; but to be entitled to such a name, it must be seen only when dead.

When living it is brilliant in its green shades, from a light to a brownish tint: the belly is of a silvery white, with interrupted brown lines running from before to behind. This species is smaller than the common bream, and more frequently lives among rough or rocky ground. It is a very powerful fish on the line, and is remarkable for being exceedingly fat. Like the other breams it feeds on Crustacea, and browses on the sea-weed. The intestines are long, and the molar teeth well fitted for grinding.

The other breams found in the Cornish seas, are

Ray's Bream, *Brama Raii*. Two specimens of which have been taken at Polperro, and the late Mr. Chirgwin informed me that one had been taken near the Runnel Stone, on the western part of Mount's Bay.

Couch's Sea Bream, *Orphus Rondeletii*, vel *Pagellus Rondeletii*. The capture of this fish is noticed in the 'Zoologist,' (Zool. 81).

Short Sea Bream, *Pagellus curtus*. The particulars of this fish, with a figure will be found in the 'Zoologist,' (Zool. 393).

Next to the pilchards, the most important fish to the fishermen, is the mackerel, for more hands are employed, and more capital is embarked in its capture than on any other. The *Scomberidæ*, though few in numbers, as it regards species, appear on our shores in countless multitudes, and are very remarkable for the brilliancy of their colouring, elegance of their shape, and the rapidity of their movements, and the common mackerel may be taken as the perfection of the class.

When buxom Spring's luxuriant airs inspire
The softer wish, and blow the genial fire,
The Mackerel rushing from the Atlantic deep,
In midland seas with us their nuptials keep.—OPPIAN.

Common Mackerel, *Scomber scombrus*. This species is too well-known to require any notice of its specific characters, and too highly valued as food to require anything to be said in its praise, I shall, therefore, merely refer to its habits. They are remarkably active as swimmers, and very voracious as feeders. They always remain on our coasts, for during 1845, I saw and examined one or more specimens in every month of the year, and I have seen them during many other years equally through each month. They do not, therefore, perform those extensive migrations which some authorities describe with such wonderful minuteness. The size of the schulls which occur on our shores varies very much, but their migrations have occurred for many

years past with great regularity. The fishery, therefore, though carried on with punctuality so far as regards the season, is very uncertain in a remunerative point of view. In my conversations with the fishermen of Mount's Bay, I find that they vary but little as to the periods and directions in which the fish pass and repass along the Cornish shores, and their observations agree with my own notices of their appearance, localities, and seasons in which they are caught. The fishery in Cornwall may be divided into three kinds—the autumnal and winter, the spring, and the summer. In the autumn, the fish appear in large schulls, about six or seven leagues south-west of the Scilly Islands, going either in an easterly, north-easterly, or northerly direction, or in the entrance to the Bristol Channel and Irish Sea, the last of which appears to be their favourite autumnal resort. As winter approaches they pass into the English Channel, either to the south of the Islands, or in greater quantities from the Irish Sea between the islands and the main land. The largest quantities pass up the British, and but very few up the Bristol Channel. The fishery, therefore, during the autumnal and winter months is carried on off and around the Scilly Islands, from two to seven leagues from the shore. The French boats, go still further into the Atlantic, and prepare their fish for their own markets by splitting and salting; this the Cornish fishermen never do, if they can find a market for them fresh. During this fishery the largest and best fish are taken. If examined, they will be found full, and perhaps too fat for the table; they are in fact, in their most perfect state or condition. At this season they are not with spawn; or at least, after examining many specimens from most of the boats at different times I have rarely found any in them. To one who is accustomed to see only the fish of the eastern part of the Channel, those just migrating from deep water must appear of almost monstrous size. Many catches will average eighteen inches in length each, but twenty and twenty-two are not of unfrequent occurrence, the largest I ever saw was in the possession of Mr. E. Chirgwin, and measured twenty-three and a half inches long. Fishing so far from the shore, and sometimes taking very large catches, the boats act in concert for their mutual advantage. Thus five or six to eight or nine will act together, and one will daily take the fish of the others to some distant market. This office of messenger is taken in rotation by all; the period for which they are absent depends on the distance of the market and the rapidity of sale; Cork, Bristol, and Plymouth are the most frequented, but each boat is rarely absent more than four days, for though absent, and they receive an equal division of the fish

caught by their companions, yet all seem anxious to get back and partake of the actual fishing. In this way the fishery is never interrupted. The winter drives them high up the Channel where they remain in deep water, rarely rising to the surface till the spring. As spring advances they pursue a directly contrary course to the one described above, and again go westward, and our boats go eastward, while the Brighton and other eastern boats come westwards till they fall in with them. From this it would appear, that the distances they advance up the Channel are different in different seasons ; for sometimes they are taken abundantly off Brighton and Hastings, and at others only off Plymouth, and the Devonshire and Cornish shores. If the fish of the spring fishery be examined, it will be found that the *roe* is growing fast. The fish of this season are smaller than those of autumn ; sometimes the schulls are composed entirely of small fish, the young of the preceding year, or of mixed fish, the old and young together. The course is very irregular, sometimes they lie at the bottom in deep water, and at others rise to the surface or approach the shore. But as summer advances the *roe* becomes still further developed, and then they approach the sandy bays for the purpose of spawning. At this season they appear to be the most active, and present, from the shores, very lively and picturesque scenes. In the spring and autumn fishery, drift nets alone are used, but in the summer, when they approach the shore, seines are also employed. The spawn are deposited about June, July, and August, and in September and October they again retreat to the Atlantic and into the Irish Sea and Bristol Channel, through the space between the Scilly Islands and the main land. The spawn soon becomes developed into the young fish, which remain in the bays through the winter, as is proved by the large quantities frequently enclosed in the pilchard seines ; and on one or two occasions, I have known these young fish mistaken and enclosed for pilchards. The mackerel is a fish of very rapid growth, for the young of one season breeds the next. If the spawning occurs early, the young retire with the old to deep water again to renew their migrations. This may be taken as the result of the observations for the last few years, though it does not accord with the experience of Mr. Yarrell. It should be observed, however, that their movements are liable to variations and occasional revolutions, though the fishermen tell me, the changes have not been very great for many years. The causes for these revolutions are at present involved in great obscurity, and, as it is impossible to investigate all the circumstances connected with them, they are not likely to be speedily elucidated. There are,

however, several circumstances connected with them, which may in some measure influence them, the facts can be vouched for, though their influence may be denied.

It is a well-known fact among all who have investigated the habits of fish, that cold retards the development of the ova; that they advance to maturity according to the temperature of the season. If the season, therefore, be a cold one, the spawning of the mackerel is retarded, and so much is this sometimes the case, that the young are overtaken by winter while they are yet very small. During winter it grows but little compared with its rapidity during the summer months; and therefore in the following spring, it does not perform the reproductive functions till late, and if there are several cold seasons in succession, not till *very* late, hence we find that in some seasons the mackerel are in roe during the winter. Cold, though it can retard, cannot suspend this function, and the young are sometimes not alive till spring, when the fishermen tell me, they may be seen in thousands at the surface of the water basking in the sun. Thus then the mackerel may, and does breed at two distinct seasons of the year, occasionally. This has given rise to the opinion that some fish breed twice in the year. This I believe, however, is never the case; though distinct fish do at opposite periods: if the spawning be retarded for several seasons, the young of that period will accumulate, till their migrations will seem to constitute the migrations of the whole, and what began from seasonal peculiarities will be continued permanently as long as that generation lasts. I cannot find from any one of the fishermen that, what they call "the same fish," ever vary the periods of their movements except for a few weeks. They all maintain the spring and autumnal spawning fish are not the same; their meaning being that those fish which spawn at opposite times are not identical. In proof of this, they affect to point out differences in their appearances and markings. No two mackerel are alike, but the fishermen detect a difference which none but a practised eye can detect. On this point I was for a long time sceptical, but am now brought over to their way of thinking, and can detect the differences as readily as themselves. It is, however, not so easy in the mackerel as in the pilchard, which are liable to the same revolutions in their movements. In the pilchard these markings are so distinct and so many, that I have sometimes thought them sufficient to constitute specific differences. The periods of revolution or transition, are, like all similar times, characterized by irregularity and confusion, and are described as such by our fishermen. But if we examine them with a knowledge

that there are two great divisions of the same fish which migrate and spawn at different seasons, the confusion is removed. It has already been observed that the quantities in which the schulls appear are very irregular. That they are liable to fluctuations there can be no doubt, but that it is so extensive as it appears to be, is not so certain. The irregularity is more observable in the spring and autumn, than in the summer fishery. Some of the oldest and most intelligent of our men, entertain an opinion that if from any cause the eastward migrations pass up mid-channel, the spring fish first appear on the eastern fishing grounds about Brighton, and spawn before they get so far west as the Cornish or Devonshire coasts; hence the eastern fishery is profitable, while the western is a failure. If on the contrary, they pass up at short distances from the shore, the eastern fishery is a failure, and their boats come westward to take the fish. How far this is strictly correct I am unable to say from actual observation, but it is an opinion believed by many of the fishermen. The failure of the fishery, therefore, frequently depends on our men looking for them in a wrong direction, and thus the fish pass unnoticed. As they do not rise to the surface during the spring and autumn as they do in summer, the fishermen are obliged to fish before they can detect their presence, hence much valuable time is frequently lost, though the fish may have been passing for many days. It frequently happens when the fishery has been a complete failure near the shore, it has been remarkably successful in deep water, and *vice versa*. The fishery is, therefore, very irregular, sometimes a few thousands are all that are taken *per* boat through a season, at others they are caught in abundance. The largest quantity I ever saw taken was in October, 1844, when the boats of Mount's Bay brought on shore in three nights, one million, six hundred thousand; but great as this was, they all seemed to think the finest year ever witnessed was in 1806, but the quantities then caught I cannot ascertain. This account of their movements is somewhat different from that given by Mr. Yarrell in his 'British Fishes,' but is founded on the observations made in this western extremity of our Island. The quantity actually taken cannot be ascertained, since the largest quantities are carried to distant markets, without being brought on shore. The mackerel, though a voracious feeder, always prefers a living bait, and always strikes it backward, *i. e.* if it pursues a bait on a hook, hung from a boat under sail, going six or eight miles an hour, it pursues, and advances beyond it, turns and takes it as it advances, either sideways or directly backwards. It has been frequently observed by writers, that some fish are liable to

malformations, especially that of hermaphroditism. Cuvier and Cavolini have mentioned it in the perches, and especially in the smooth serranus. The lobe of the roe is said to consist of a portion of genuine ova, and another of the male melt. This peculiarity I have seen several times in the mackerel. I cannot venture to place myself in opposition to such an authority as Cuvier, but must however observe those I have examined did not confirm that view. If the roe be decomposed and placed under the microscope it will be found to be composed of minute granules, which enlarge till they are visible to the eye. In the melt this is not the case, the granules being displaced by vessels. If the deformed roe be taken, the supposed changed portion will be found obscurely granular, and is in fact a deformed and unproductive roe; but I would not deny in opposition to Cuvier, Cavolini, Yarrell and others, that hermaphrodites may occur. While examining this very interesting point, during the spring fishery, I was especially struck with the paucity of the females, almost every fish I opened proved to be a male; as the females were the ones for which I was in search, this struck me very forcibly. The proportions I found varied, but I think the medium proportion taken from many samples, was one female to nine males, sometimes more and at others less, and this I find has also been noticed by my father, but whether it obtains also in the other seasons I have not observed.

That the mackerel does not perform those distant migrations formerly attributed to it, is now, I believe, generally admitted; one thing however is certain, that the fishery of one coast does not depend on the migrations from any other, since they are simultaneously carried on.

Spanish Mackerel, *S. Colias*. This is very similar to the last species, but is rarer, and not so elegant either in its shape or markings. The eyes are larger, and the dorsal markings are neither so bright nor distinct, and the abdomen is marked with patches of brown. It is not so active as the common mackerel but is said to be equally voracious as a feeder. This is now a rare species, but the fishermen tell me that about nine or ten years ago many hundreds were caught every year, while now only eight or ten can be procured throughout the seasons.

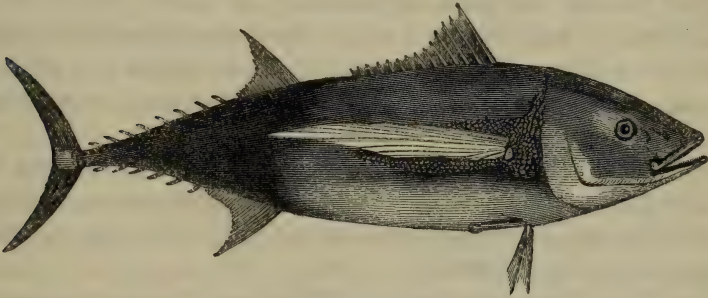
Tunny, *Thynnus vulgaris*. This elegant and graceful fish is common a few miles from the shore, around the Scilly Islands, Cape Cornwall, Land's End, Tol-pedn-penwith to the Lizard, less so eastward, but is still occasionally found on the Devonshire coasts in pursuit of the pilchard and skipper (*Esox saurus*). It first appears about

June, and continues with us till August, when it again leaves in a south-western direction, according to the fishermen. It never takes a bait, but frequently gets entangled in the pilchard drift-nets, and it swims with such rapidity as to turn the foot of the net over the buoy ropes, and so gets completely enveloped or rolled up in the net. It is a very interesting sight to see it in pursuit of the skipper, a sight which may be enjoyed on almost every summer's evening in Mount's Bay, about three miles off the shore. Their speed is very rapid, and in the eagerness of pursuit it will frequently glide into the air to the height of several feet. During some seasons they are comparatively rare, and in others they are common. In the autumn of 1840 they were very abundant, and great quantities were caught in the drift-nets, some of which weighed as much as eighty pounds. If eaten soon after they are caught they are good food, though rather too fat; but they are very injurious if eaten after being eight or ten hours out of water, especially if the weather be warm; it then produces intense sickness.

Striped Bonito, *T. pelamys*. This is a smaller fish than the last, but is equally common, and has precisely the same habits. During the last summer, while sailing across the bay, with what is called a "mackerel breeze" going perhaps seven miles an hour, one of this species started into the air after a flock of skippers some distance astern of us, and again fell into the water, but its course was marked by a continuous line of skippers, and in a few minutes it again sprung into the air just ahead; so that it travelled at a very rapid rate. It was easy to discover the species as the belts were very plain.

Plain Bonito, *Auxis vulgaris*. This is very rare, I have seen only one specimen, but two have been taken in Mount's Bay. The one I saw was taken in a mackerel seine at Newlyn in July, 1844. It may be briefly described as follows:—It was eighteen inches in length, girth behind the first dorsal fin eleven and a half inches. Viewed laterally, it has a resemblance to the common mackerel, but is more plump and the tail is proportionably smaller. From the point of the lower-jaw to the margin of the gill-cover is four and a half inches; both jaws are pointed; mouth small; teeth small and fine. Eye large, an inch from the snout. First dorsal fin is five inches from the snout and placed in a fissure which hides it, when pressed down; its fin-rays are somewhat spinous, the first two, longest and closely united. The distance from the first to the second dorsal fin is six inches; the latter is crescentic posteriorly. The caudal fin is lunated, and the vertebræ nearly reach to its posterior margin. The finlets are

eight above and seven below. The ventral fin resembles the second dorsal. The pectoral fins are small, stout, and placed in a sulcus on each side; their origins are immediately behind the gill-covers, and anterior to the line of the origin of the first dorsal fin. The abdominal fins are short, stout, and lying in a sulcus: as the sulci of each communicate, they appear to lie beneath a scale. Around this and reaching to the gill-covers is a patch of scale-covered surface or cuirass, which extends two inches behind the pectorals and there contracts into the lateral line, from whence, in a stitched manner, it passes on to the tail. The other parts of the body are smooth. In colour it was of a dark or black-blue, and the back, though faintly, was definitely, marked with marbled lines and ocellated spots. The number of fin-rays is, D 9; 7. P 21. V 6. A 8. C 15.



The Long-finned Tunny.

Long-finned Tunny, *Orcynus ala longa*. (Cuv.) Two specimens of this fish have been taken in Mount's Bay in a mackerel seine. One is in the Museum of Natural History of Penzance, which was caught several years since; the other was caught during the present summer, from which the following description is taken. As Mr. Yarrell has not included it in the second edition of his 'British Fishes,' I have sketched a full-sized figure of it, of which the accompanying is a reduced copy. It was eighteen inches long and five at its greatest depth: its colour was a bluish black, or deep mackerel tint, and plain above, fading below into a pale blue, yellow and white. The shape resembles the bonito. The eye is large and placed over the angle of the mouth: the mouth is rather small, gill-covers smooth. Immediately behind the gill-covers, and below and around the origin of the pectoral fin, and along its upper margin extends a corslet, forming a sulcus into which the pectoral fin falls; it rises also to the back and

extends to the second dorsal fin. The pectoral fin is large and long, and extends from immediately behind the gill-covers to the posterior margin of the second dorsal fin. The first dorsal fin is spinous and arises on a line posterior to the origin of the pectoral; the first four rays are the longest, the fifth, sixth, seventh, eighth, and ninth gradually decrease in length, and the rest are of equal length. The second dorsal is soft and crescentic posteriorly, vanishing into the finlets. The ventrals are, first spinous, and the rest soft. The ventrals of both sides closely approximate, and lie on a scale around which is a furrow or sulcus, and between them are four false rays. The caudal fin is crescentic and large. The abdominal like the second dorsal is crescentic and disappears posteriorly into the finlets between it and the tail. The fin rays are P 37. D 14+15. V 6. Ab. 13. C 40. fin $\frac{7}{8}$. This specimen was caught while fishing for mackerel, and considering its size exhibited extraordinary strength. Of its habits I could discover but little, but its Mediterranean history is much like that of the bonito. The gape is small, the lower jaw is much longer than the upper, and both are furnished with a single row of small, sharp, and incurved teeth.

Sword Fish, *Xiphias gladius*. Specimens of this fish are occasionally seen by the fishermen in the south-west portion of Mount's Bay, several have been taken, the last of which was caught in Gwavas lake, near Newlyn, in 1843.

Pilot Fish, *Naucrates ductor*. This elegant fish is occasionally to be met with in Mount's Bay; but its presence can always be traced to the arrival of some foreign vessel, around which it always continues. It has also been caught at Falmouth.

Bogue, *Box vulgaris*. A specimen was taken in a ground seine at St. Mawes, near Falmouth, in October, 1842. It fell into the possession of Alfred Fox, Esq., by whom it was presented to the Museum at Truro.

Scad, *Caranx trachurus*. This is a common fish on all parts of the Cornish coast, and though used as food, is held in very little estimation. Like the mackerel, it congregates in large schulls and performs its migrations in the same manner. The schulls are sometimes very large. Their habits greatly resemble those of the mackerel. During the autumn they retire to deep water in the entrances to the English and St. George's channels. The mackerel and scad do not intermingle much, except near the Scilly Islands, where they are frequently caught together in large quantities. North of this, the mackerel predominates, and in the south, the scad, from this circumstance

I have supposed that the scad takes up its autumnal quarters to the south of the great mackerel schulls, the borders of each intermingling. They pass up the channel during the spring in the deep water, feeding at the bottom; but as summer advances, they approach the shores and swim high. At this time they are abundantly caught both by the mackerel nets and by the hook-line. They are brought to the market at Penzance, but are never purchased except by the poor. The fishermen have them split and dry-salted for their families, and for sale; and during the winter they are to be purchased salted at Penzance.

The schulls of this fish come into Mount's Bay sometimes in immense masses, and 20,000 have been taken in a single net at one time. At this time, when they are meshed in mackerel drift-nets, it is always on their eastern sides, showing that the direction of the fish is to the west. In October and November they disappear in the western waters. The young remain in the bays till the spring. It spawns about July and August, and they feed on living food, especially the sand lance, in pursuit of which they sometimes thrust each other on shore on the beach near Marazion.

Black Fish, *Centrolophus pompilus*. Two specimens of this rare fish have been taken in Mount's Bay, one of which is now in the Museum of the Natural History Society of Penzance. It has been taken at Love, one specimen by the Rev. Mr. Iago the correspondent of Ray, and two by Mr. C. Jackson. There are now six specimens on record, as having been caught in Cornwall, and with the exception of Mr. Iago's, all were taken in the mackerel seine net. From this we may suppose that it migrates about the summer into shallow water. It is a remarkably powerful fish.

Dory, *Zeus Faber*. This is a too well-known fish, to require any more than a passing notice. It is common, and may be found in our market daily during the fishing season: it wanders very much, or rather is fond of partial migration from rough ground in deep water, to sandy bays and shallow water. In the depth of winter it retires to the deep water, and returns in excellent condition in the spring: it feeds on small fish, such as the pilchard, small pollack, cuttles, &c. There is one habit, which I have never found even alluded to by authors, but which is well-known to the hook-and-line fishermen. The dory will frequently retire to the rough ground or make a slight depression in the sand: thus half hidden the tendrils of the dorsal-fin are allowed to float about like so many worms, to the temptation of all passers; when a small fish, cuttle, or in fact anything has laid hold of any one

of the tendrils, the powerful ventral fins are then brought into play, the fish starts up and opens its capacious mouth, and so catches the unwary victim. It also pursues its prey by means of a rapid succession of jerks.

There are many fish which have fleshy prolongations on their head and back besides the dory, such as the Labridæ, &c., they are all low swimming fish, and most of them frequent rocky ground and crevices, overhung with seaweed. In watching them as they pass and repass between the rocks, and when I have placed them in pools where it has been much easier to watch them, it seemed as if these fleshy prolongations were used as instruments of touch; but for what purpose seems doubtful. It may be to warn them from entering a crevice too small, or to give notice of what is above them.

The dory is a very gluttonous fish, and my father mentions having found in the stomach of one twelve inches and a half long, twenty-five flounders, of which few were less than two and a half inches long; three half-grown sting fishes (*Cottus scorpio*), and five stones, taken apparently in the eager pursuit after its prey. The dory was so gorged, that it suffered itself to be taken by the hand.

Boar Fish, *Z. Aper*. A figure of this species is to be found in the 'Zoologist,' (Zool. 191). The first recorded British specimen of this fish was taken in Mount's Bay; another in 1841 was taken near Falmouth, but in July, 1844, two hundred specimens were taken in a trawl-net, near the Runnelstone in Mount's Bay. In July, 1845 others were caught in the same locality and were exposed for sale in Penzance market. I found it by no means a very delicate eating fish, though it was cooked in a variety of ways. The size of the specimens examined varied from five to seven inches, the depth about three, and the girth about seven inches in front of the first dorsal fin. The snout is long and capable of a still further extension of about seven-eighths of an inch. In Mr. Yarrell's figure of this species the first rays of the dorsal-fin are represented as serrated, which was not the case in any example, but the first ray of the ventral was very strongly so. The general colour of the specimens while living was a fine crimson, delicately bright and faded into yellow, and from thence to a silvery white as it approached the belly. In the first specimens seen there were no lateral bands as are sometimes described, but in those examined last year, they were distinctly though faintly marked:

D 9+24. P 13. V 1+5. A 3+4. C 14.

Two specimens are preserved in the Penzance Museum.

The Scabbard Fish, *Lepidopus argyreus*. This is a rare fish; two

specimens have been taken in Mounts' Bay. One was sent several years ago to the Linnean Society, and the other is preserved in the Penzance Natural History Society.

Ceil Conin, *Gymnetrus Hawkenii*. This singular looking fish has been taken in Mount's Bay once in 1791. It was drawn ashore dead near Newlyn. It is found in India.

Red-band Fish, *Cepola rubescens*. This is by no means a rare fish, but from some peculiarities of habit is not often taken. I have never seen it taken in a net. Two specimens I have taken from the stomach of a cod, and one from a hake, and several others I have seen washed ashore after a storm. I have seen two alive, and the colour was a crimson, with a ground of light-yellow. When dead, it fades to a yellowish white, frequently retaining a red margin round the length of the body. From never having seen it in a net, nor in the stomach of a sand-fish, from having found it in the stomach of the cod and hake, and from its being washed ashore in rocky parts of the Bay, it seems probable that it lives in moderately deep water on rocky ground.

Gray Mullet, *Mugil capito*. Common in sandy bays and creeks. It never goes into very deep water, but during June, July and August it enters harbours in search of food. During the summer months it may be seen prowling about on the muddy bottoms of rivers and harbours, with its mouth close to the ground in search of food. It never eats anything either hard or living, but invariably prefers anything soft and pulpy. Its food is taken between its large and fleshy lips, and instead of being swallowed whole, is sucked away in fragments. It is this habit which renders it so difficult to be taken with the hook. During the fine weather of summer it frequently mounts to the surface either for sport, or in search of any floating food. It spawns about June and July, and in August the young may be seen advancing with the flowing tide, up fresh-water streams. The adult ones also like an occasional change to fresh or brackish water.

Thick-lipped Gray Mullet, *Mugil chelo*. This is also a common species frequenting our harbours, rivers, and inlets of the sea, in large schulls. It is more gregarious and smaller than the last. It delights in roaming among the loose and soft green sea-weed, over the muddy banks of rivers, or in sporting along the surface of the water on a calm summer evening. Like *M. capito* it lives on dead and soft food and is rarely, if ever taken, except by the seine or drag-net. There is one habit of this as well as the gray mullet, which though perhaps well-known, yet I have so often witnessed it, and always felt so interested

in it, that I cannot forbear mentioning it. The usual mode of taking the mullets is by enclosing them in a seine and then drawing them on shore. As soon, however, as they find themselves enclosed, they seem confused and wander from one part of the net to another to discover a means of escape. Order, however, as if by mutual consent is very soon established, and the largest of the schull generally takes the lead in every subsequent undertaking. Thus guided, every portion of the net is carefully examined, and if a hole is found, through it they all make their escape. If unsuccessful in this, the foot of the net is attempted to be lifted, but the trial always fails, and many are meshed in the attempt. Baffled at all points, they retire to the centre of the space enclosed by the net, and after a short time the leader rises swiftly to the corks, and followed by all the others, throw itself over into the water beyond, and thus they effect their escape. It is an exceedingly interesting sight to see them thus make a series of efforts for a given object, adopting them in succession as if by reason. The fishermen are now in the habit of scattering straw along the inner margin of the buoys, the fish deceived by this, throw themselves over the edge of the straw, but alas ! again fall within the enclosure ; and having once failed they never renew the attempt.

Sand-smelt, *Atherina presbyter*. Common during summer, and is frequently caught from the pier-head by anglers. It spawns in June, July, and early in August.

Gattoruginous Blenny, *Blennius gattorugine*. This is a common fish, inhabiting deep water on rocky ground. It varies in length, from two to seven inches : it is frequently caught in the crab-pots : it is voracious, feeding principally on small crustaceans : it varies in colour according to the ground it occupies ; but it is in general of a deep-brown.

Montagu's Blenny, *B. Montagui*. To be found in crevices of the rocks between tide-marks or under stones, where it remains dry for several hours during the day, solitary. It is active, and frequently observed peeping from a crevice where it has taken shelter till the return of the tide. On being observed it actively withdraws itself out of sight. Spawns in August, and deposits its ova over the surface of the cavity on the under surface of the stone beneath which it has taken shelter.

Shanny, *Blennius pholis*. Common everywhere in pools between tide-marks. It appears to be a favourite habit with it to be at the rim of the water, rapidly retreating on the least alarm. Yet it is by no means a timid fish ; on the contrary, it is either very bold or very stu-

pid, since it will even mistake your finger for a bait and unconscious of danger will attempt to bite. It deposits its ova on the upper surface of small caverns in the rocks, a particular description of which has already appeared in the 'Zoologist' (Zool. 798).

Butterfly Fish, *Blennius ocellarius*. A single specimen of this fish was taken by a trawl-net in 1845, but the spot on the first dorsal fin was so obscure as scarcely to be noticed.

Crested Blenny, *Blennius Yarellii* of Valenciennes. A single specimen only has been taken in the district of the Land's End. But it has been taken so frequently in other parts of South Cornwall, that its rarity here arises from the limited search I have been able to make for it.

Butter Fish, *Murenoides guttata*. (Lacepede). This fish is called butter-fish, I suppose from its soft and unctuous feel. It is a very pretty fish, and very elegantly mottled. It is occasionally found in pools, it swims rapidly and is somewhat difficult to catch. Its colour is a brownish purple.

R. Q. COUCH.

Penzance, Cornwall.

(To be continued).

Large-sized Jack. — In the early part of last week, a fish of the above kind, of large dimensions and singularly fine proportions, weighing fifteen pounds and a half, was to be seen in the shop of Mr. Barnes, fishmonger, Capuchin-lane. The fish was caught in the Lug, not far from this city.—*Hereford Journal*, April 22rd, 1846.

Huge Sturgeon in the Wye.—On Sunday evening last about sunset, as James Postans was angling in the river Wye at the Weir, five miles above Hereford, he observed something quietly basking in the water, which he at first took to be a salmon, but further observation convinced him that he had lighted upon a monster of the deep such as was never before seen in these parts. He struck it with his rod, which produced little effect, and equally unsuccessful was the effort to seize it by a kind of sail which was elevated above the water. At last after a chase of half an hour, Postans inflicted in succession two deep wounds with a pocket-knife which he carried with him, but still the creature evinced no disposition to give in. During the struggle which took place in the ford, which was about knee-deep, sometimes the man was uppermost and sometimes the fish. The biped foe, however, though no little astonished and somewhat daunted, inserted his hand into one of the gashes towards the tail, from which the crimson tide flowed copiously, and was at last enabled to land his prize, which did not finally give up the ghost till eleven o'clock at night. It proved to be a Royal Sturgeon, of the extraordinary length of eight feet six inches, girth three feet, and weight *one hundred and eighty-two pounds!* A fish of such dimensions was never before captured so far up the Wye, and the wonder how it came there can only be explained by the supposition that it was washed up the river by the tide of the Severn at Chepstow,

and was unable to find its way back. It is calculated by experienced fishermen that during its course it must have passed about two hundred nets! The royal fish is to undergo a preserving process, and will be exhibited to the public.—*Id.*

Dreissena polymorpha in unnavigable water. (See Zool. 254, last line).—Some eight years ago, while angling in an old mill-dam at Toton, Notts, with my brother, he pulled up on his hook a specimen of *Dreissena polymorpha*, adhering to a stone. The dam is supplied by the Erewash, a small shallow stream which joins the Trent nearly a mile from the place, that river being the nearest navigable water. I afterwards found numbers of these Mollusks adhering to the stones underneath the waterfall of a pond at Lenton, near Nottingham, to which they must have gone up a very small brook fully a mile from a canal; in which, however, though I have frequently searched, I have never found them.—*George Wolley*; 9, *Cambridge Street, Liverpool, February 23rd, 1846.*

Mollusca found in Cornwall.—The following is a list of species belonging to the Lamarkian family Polythambia which have been found in Cornwall. For the first five species I am indebted to Mr. Couch's Fauna of the county. For the rest I am responsible, and have specimens of all in my cabinet. The list, however, must be very incomplete, my observations having been almost exclusively confined to Falmouth harbour and its immediate vicinity, so that the list is almost simply an enumeration of the inhabitants of that one locality.

Orthocera recta (*Montague's Nautilus rectus*). This, Mr. Couch has found adhering to the shell of a Pinna from deep water.

Orthocera imperforata (*Fleming*). This shell is usually classed as a Dentalium. I regret that I have not had an opportunity of examining it.

Spirula australis. It sometimes floated to our coasts.

Vermiculum perforatum (*Mont.*) Found in Cornwall by Montague.

Vermiculum intortum, (*Mont.*) Not uncommon. In Thorpe's 'British Marine Conchology' no mention is made of the strong central tooth which is found in the aperture of this species.

Vermiculum oblongum, (*Fleming*). Of this rare species I have obtained a few specimens from oyster shells, dredged in Falmouth harbour.

Vermiculum subrotundum, (*Mont.*) A few specimens from Falmouth harbour on oysters and in shell sand. I consider it one of our rarer species.

Vermiculum Wollastonianum, (*King*.) Upon the oysters dredged off St. Mawr's I have found a species which I have provisionally named as above, because it is certainly new to the British Catalogue. I regret that I have not had an opportunity of consulting any foreign works, and therefore I am quite ignorant whether it has ever before been described. The following is the description of the shell: shell suboval, *strongly striate* longitudinally, very thick in the centre, *flat on one side, very convex on the other*. On the flat side three volutions are visible, on the convex side four. Colour reddish yellow. Aperture oblong or even linear, with a very narrow, erect linear tooth extending more than half way up the centre of the aperture. Length 0.03 inch. I have dedicated this species to my friend T. V. Wollaston, Esq., B.A., F.C.P.S., Jesus College, Cambridge.

Vermiculum bicarinatum, (*King*.) This species I have ventured to name for

the same reason with the preceding. The following is its description: shell oblong, *irregular*, thinnest at the centre, of four irregular arcuated turns, which are *strongly striate* longitudinally; having on the outer volution *two carinations*, one at each edge, a third is sometimes visible in the middle of the last whorl. *Aperture produced*, contracted, strongly wrinkled: the opening oval, with a strong, central emarginate tooth, extending about one-third the height of the mouth, 0.10 inch. My specimens are from oysters and sand from Falmouth harbour.

Vermiculum simile, (*King.*) Shell oblong, *smooth*, thickest at the centre, with four (sometimes five) turns visible on one side, and three on the other: the *outer volutions rounded*. Aperture hardly produced suboval, with a small central emarginate tooth. Length 0.06 inch. In very old shells a small subcarination is sometimes visible on the last whorl. It is a critical species bearing some resemblance to *Vermiculum bicornis* and *V. bicarinatum*. From the former, its aperture and the great number of its volutions visible, at once distinguish it: its smoothness, and the regularity of its form, as well as its aperture distinguish it from the latter.

Spiroloculina concentrica? (*Macgillivray*). To this species, of which I have only met with three specimens I have affixed a mark of doubt, as those which I have found differ from the only species of this genus hitherto described not only in colour, shape, and the number of its cells, but also in its cells being hardly to be distinguished from each other, there being no visible suture. As I have no specimens of the original species I think it better to leave it thus than to describe it as new. I shall esteem it a great favour if any of your correspondents can furnish me with a specimen of the original species for comparison.

Arethusa lactea, (*Fleming*). This rare species I have found on the upper valves of the *Pecten maximus* from Falmouth: also in shell-sand from the Land's End.

Arethusa Newnhamiana, (*King.*) I have thus provisionally named a species which exists in the shell-sand in Falmouth harbour in astonishing abundance. From its congener it is perfectly distinct: shell globular, semi-transparent, with three and a half or four whorls. On the body volution are *ten or eleven oblong convex* chambers with slight *separating depressions*. Diameter 0.025. From *Arethusa lactea* it differs in its smaller size and in the greater number and convexity of its chambers. I have dedicated this pretty species to my friend W. O. Newnham, Esq., St. John's College, Cambridge.

Lobatula vulgaris, (*Fleming*). This shell is exceedingly common on the upper valves of the *Pecten maximus*. I have found it between tide marks on a living *Fissurella Græca*.

Lobatula pulchella? (*Macg.*) The shell which I have referred to this species presents some marks of difference from the shell described by Macgillivray. I cannot, however, at present decide upon its distinctness. It is common on the valves of the *Pecten maximus*, associated with *Lobatula vulgaris*.

Rotalia Beccarii, (*Fleming*). I have found but a single specimen of this shell. It was on a valve of *Modiolus discrepans*, obtained at Falmouth between tide-marks.

Rotalia inflata, (*Fleming*). Not uncommon on oyster shells. I found it also on a *Fissurella* between tide-marks.

Polystomella crispa, (*Lam.*) Common on oyster shells. Its young state differs in one respect so remarkably from the adult shell, that at first I was strongly inclined to think it distinct. The sharp, carinated rim is sometimes in the young shell armed

with six or eight spines, which add greatly to its beauty. In the older shells they gradually disappear.

Polystomella umbilicatulæ, (*Macg.*) A single specimen only has occurred to me in the shell-sand from Falmouth.

Polystomella Gulielmina, (*Macg.*) This I have named with doubt, as the shell has hitherto been only described as found at Aberdeen. I found it on an oyster shell dredged off St. Mawr's.

The following shells hitherto unnoticed as found in Cornwall have occurred to me:

Dentalium glabrum. Shell-sand, Falmouth.

Pholas candida. Penzance.

Solen vagina. Shell-sand, Falmouth harbour.

Psammobia tæniata, (*Turton*). Not uncommon at Falmouth.

* *Crapina scotica*. Obtained by dredging at Falmouth harbour.

Limnæus glaber. Is mentioned in Mr. Couch's Fauna, on the authority of Montague, since whose time it has not been found in the county. I am happy to state that I have found it near Probus.

Velutina otis. Gewan's Bay, between tide-marks. It is probably common, but not easily found on account of its minute size and brown colour, which afford it great security from the rapacity of collectors.

Odontomia rissoides and *Odontomia turrita*. Oyster shells, Falmouth.

Turbo terchosus. Abundant in a small spot near high-water mark in Truro river. This species is viviparous. I have found the mother filled with young fry $1\frac{1}{2}$ whorls, April 28, 1846.

Turbo jugosus. Is reckoned a species in Thorpe's 'British Marine Conchology,' and it has not as yet been noticed as found in the county. It may therefore be important to state that it is common on our coasts, particularly at Cape Cornwall.

Cingula semicostata. Of this rare species I have found a single specimen in shell-sand from Whitsand Bay.—*Robert L. King; Grammar School, Truro.*

Miscellaneous Facts in the Natural History of New South Wales

By C. H. HORSLEY, Esq.

ALL those runs where cattle or sheep are kept are generally without the boundary, and a tax of £10 is paid to government. There is always beautiful pasture, as besides our cattle, so poor is Australia in quadrupeds, there is nothing to eat it off. This country is a most peculiar one, differing from any other I have ever visited or read of. It is covered generally with wood, though in the interior there are extensive grassy plains with scarce a tree upon them for miles: this forest-land under certain appearances has different names. What I should term "Jungle" is here called "Bush," which signifies a

* Since writing the above, *Lucina rotundata* (*Turton*), has occurred to me. Two specimens I have found in shell-sand from Falmouth harbour. I consider it therefore a rare species on our coasts.

country in a state of Nature. Most of the trees are evergreen, but there is not a sufficient variation in their foliage to render the view pleasing: the eye soon grows weary of viewing the same endless track of sombre forest. Fires lighted by the natives and left, frequently run through the "Bush," scorching many a stately tree, whose black and decaying trunks do not relieve the dreary solitude. Not a tree or herb bears food for man, and woe to him who should lose his way,—his death would be most certain. The grass is pretty plentiful on most of the land, except the sandstone districts, and affords good pasture. Gum-trees, so called, are of several varieties, named from the appearance of the bark, and iron-bark trees are the most common and grow to a prodigious height and girth: these with several varieties of the oak—the colonial appellation for the *Casuarina*—fir and apple-tree, (not the English apple-tree or anything like it) and other trees of which I know not the names make up the forest trees. The branches are generally at the top, so that riding through the forest is not attended with difficulty. On the banks of rivers and swamps vegetation entirely varies; it has of course a brighter tint, and becomes an impenetrable thicket, or as it is called a "thick bush." In barren sandstone districts the forest degenerates into a "scrub," and has a melancholy appearance,—low stunted bushes alone grow there—grass is seldom seen—it is a desert. The country is generally intersected with ravines and water-courses, which in the rainy season are torrents overflowing and inundating the low grounds and sweeping away all traces of industry. There are few quadrupeds, save several species of the Kangaroo, Native Dogs [*Thalycinus*?], and Cats [*Dasyurus*?], Opossums and Flying Squirrels [*Petaurus*?]. These are all the animals I have seen.

Birds are very numerous, have curious names, and equally curious and peculiar notes; most of them far from beautiful. Amongst the harmonious choir there are many small birds whose names I do not know; also the "Organ-bird,"—a black and white bird about the size of a magpie, and the small "Bell-bird," so called from its ringing note, are pleasing to hear. The "Laughing Jackass," one of the Kingfishers, when heard early in the morning or late in the evening makes you imagine yourself surrounded by a score of hearty, but discordant laughers. The "Coachman" has its name from its call resembling the smack of a whip. Cockatoos, black, white or gray, and Parrots and Parroquets of all the most gorgeous hues are very numerous, and have the scream natural to their tribe, and are also good mockers. Kangaroos are now seldom seen; civilization has driven

them with the natives into the interior, and the traveller has the forest all to himself. The natives are seldom seen but around the public houses; they are ugly in the extreme, especially the females — excepting a few: here is a picture pretty faithful—wide nostrils, expanded still farther by a bone passed through the cartilage; hair hanging in profusion and disorder around the face, save when gathered up into a knot on the crown and surmounted by a tuft of long feathery grass; savage, glaring eyes, overhung by shaggy eyebrows, and broad forehead, with a treacherous smile constantly on the thick lips complete the monster. They frequently fight amongst themselves, but not so many are exterminated by warfare as by the vice of drunkenness, unknown to them, I believe in any shape before our arrival. Now our alehouses are their constant haunts, and many are killed by the use of spirits. Where in the memory of an old settler, three or four hundred danced their dance around their fires, now are seen but as many tens, and the miserable wretches disinclined to work and seeming alone alive when drunk. In the interior this rule does not apply; our vices have not reached so far, and the tribes are in their natural state of savage freedom.

It is not easy to find large insects, except some of the Mantis tribe, and those I have seen are similar to those of India. Spiders are very numerous, beautifully marked, and of great variety. Flies of innumerable varieties are plentiful, many of them stinging, and there is one, the pest of the house, about the size of our blue-bottle, but fulvous on the abdomen: the rest of the body is grayish black; the whole hairy. Most of the flies are found apart from houses, in the forest, in the glen, or on the river. With the exception of the fly above-mentioned these insects trouble not man, but the species I have described is very disgusting, for during the hot months it literally lays maggots on any meat it can get at. There are a great variety of Curculios. Grasshoppers are beautiful and greatly varied. Snakes are plentiful and venomous, I cannot hear of one not being so, though of course it is probable that some of the species are innoxious. The rivers and lakes abound with fish, tortoises, most beautiful frogs, crayfish, two kinds of eels, and numerous insects.

Garden produce is the same here as in England; there are no vegetables indigenous to the colony. Fruit-trees are a mixture of Chinese, Indian and English. The peach, fig and vine flourish particularly.

There are a great variety of pigeons, which are difficult to get at, as they inhabit the thickest scrubs, where are also a kind of kangaroo, known in this colony as the "Paddy Melon," and Kangaroo-rats;

both these are good to eat. There being some very thick scrubs near me, I accompanied a gentleman some days ago after these jumpers. Between the brushes are patches of long grass, out of which the dogs drove the animals, and we shot at them as they bounded, or rather hopped past us at a rapid rate. It is something like rabbit-shooting, for your aim must be quick and fire sharp, or a bush screens them directly. On this day we shot four different varieties of pigeon, all beautiful. The "Paddy Melon" is about the size of a good hare. In the interior the Wild Turkey, or as I judge from the description, a species of the Bustard, is in plenty, and the real Kangaroo which civilization has driven back. But all in all, it is astonishing how free from indigenous beasts is this colony, at least what we know of it.

There is a little Creeper smaller than the English; his head, back, and breast are bright scarlet; belly and vent ash-gray; wings black, edged with dull white; tail black. I have one, but not full-feathered, as the scarlet on the back and breast is intermixed.

The throat of the Laughing Jackass, (*Alcedo gigantea*?) is white; belly the same, with faint waves of brown; vent white. The top of the head is light and dark brown, and just over the eyes is a black or dark brown stripe, reaching completely round the back of the head, and under it round the back of the neck is the same colour as the belly; the back is a dark wavy brown, till reaching near the tail where it is waved with light blue, which in certain lights has a purplish cast. The tail is alternately barred with black and chestnut, the end white. The quill-feathers are black with a white bar across their centre, and the remaining part black-edged and waved with light blue, as on the feathers above the tail: the beak is black, long, and pointed; under mandible flesh-colour. Male and female vary but little in plumage. It is altogether a *land* fisher, feeding on snakes and insects, and it is a great enemy to young birds and eggs, and is frequently chased to a distance by a mob of the latter. I never saw it frequent the water. It builds its nest in the hole of a tree, generally selecting the large excrescence of the Termites, in which it scoops a hole large enough for its purpose, and as far as my observation goes, brings forth two young ones. It has a most discordant note resembling a most diabolical laugh, long, loud and discordant; hence its local name, "Laughing Jackass."

I have succeeded at last in obtaining for you a specimen of the Platypus. This extraordinary animal, or fish, or bird, or a combination of the whole, was caught in a net in the Paterson River. The blood has been saved by a young man to send to England, as some

Society has requested him to furnish them with it, that they may analyze it. My specimen was a female, and wants the strong nail or spine on the hind legs. There are none to be found so low down on the Hunter's River, as I live, for the sea affects the river. It is rather difficult to procure a specimen; when wounded it sinks: snares and nets are the best methods of procuring the animal.

The Wild Dog is the scourge of the flocks; they are black or red, and do not bark, but howl in a most dismal manner, and ever shun the face of man, whose presence is alone sufficient to put them to flight, even though fastened on their prey. There is a great dislike to them by their domesticated brethren of the canine race.

The wild parts of the country are fast becoming tenanted by herds of wild cattle, originating from some few escaped from the herdsmen.

One of the few, if not the only bird, which is fond of the haunts of man, is a pretty little Swallow. Though many birds are to be seen close around our dwelling, this small bird is more bold than all others, exceeding its English relative in tameness; it is not satisfied with the eaves of our houses, but brings its little pellets even into the houses themselves, and commences its nest upon some previously surveyed beam or rafter of our rooms, performing its task for a few hours in the morning. When the walls of its nest are completed, it warmly lines it with feathers, and during the whole time of its operations it displays an utter fearlessness of the tenants of the room it has chosen. It begins to build in the last week of July or beginning of August, by the end of which month the young ones appear. The eggs are white, spotted with red, and generally four in number. The female is scarcely different in plumage save being more dusky; they are lively birds, and in habit strongly resemble the English house-swallow, which also it somewhat resembles in plumage. Its back and head are purple, wings and tail black, front, throat, and breast reddish, belly and vent ash-colour, wings long, and strongly forked tail. In pursuit of its food, in flying high or low, in fine or bad weather, or before it, it also resembles the English species. Though the bird is more abundant in the warm months, it never altogether leaves us. The whole length is about five, or five and a half inches.

At this season (August) all our smaller birds are beginning to build their nests and may be seen hurrying to the favoured bough with stick, straw, or feather, as their wants require. The Magpies, of late so troublesome to our maize crops (their associates the cockatoos and king parrots have left us) are now making up for their misconduct, and

are of great use in following the plough and clearing the soil of the grub of a black or brown beetle or chafer. This grub is very abundant, and resembles the grub of the cockchafer; it is white, with a brown hard horny head, armed with formidable forceps, with which it destroys many plants by cutting them below the soil. Instead of my gun being levelled against the magpie, I now admire this bird. It is unlike the English magpie in plumage, being for the most part black with white across the wings, a triangle of white above the root of the tail-feathers, the ends of which are also edged with white. Its note is not unmusical, and its bright yellow irides give the eye a sparkling and animated expression. Fearless of man, it generally builds in some tall tree near cultivated ground: the nest is in the shape of a small bowl, formed of clay or cement, and smoothly plastered on the outside, and is firmly fixed on a bough. Of its inside structure I cannot speak, never having had the inclination to fall the tree. They are very social in their habits, only separating to pair, which they do, I rather think, some time in September. The colonial name is the "Mutton-bird."

A name in this country does not necessarily class a bird, tree, or flower; for the most opposite are given to the different objects of nature that can well be imagined. For instance, the *screech owl* which is heard uttering his mournfully prolonged scream at night is no other than a *plover*. The bird is never seen in the daytime, unless scared from his screaming-log or stone by some passer by. I once saw one that had been shot, but I had no opportunity of examining it further than to identify it as a plover. I have gone out many a night after them, but never succeeded in coming on them. When I thought I had approached close to them I would hear their scream, as if in derision, in quite an opposite direction, quite baffling all my attempts to find them out.

Some of your English Honey-bees have been transported to this colony within the last year or two (1842) and succeed well, and no doubt many will soon desert the hives of their few proprietors, and spread over the country. We have our bees, but I believe there are none with stings. They form their hives in hollow trees.

The only insects to be found now (August) are a few species of beetles under logs and stones, and many of them on being taken hold of, emit a most pungent vapour, which readily enters the pores of the face, and causes a smarting sensation. Others, like your Bombardiers give off a puff of smoke from their tails on being touched. They do

not appear to be able to do this more than two or three times, as far as I have observed.

You would be very much amused to see a native climb a tree for an opossum. These savages are particularly expert in detecting whether the opossum or the flying squirrel is in a tree. They examine the bark, and by the freshness of their claw-marks readily tell if the animal has ascended the previous night; being fully assured of this from the absence of any descending track, they immediately commence the ascent: the height of a tree never deters them. With their tomahawk they first make a notch in the bark a step from the ground, deep enough to ensure a support for their great toe; standing on this, they support themselves with one arm round the trunk, and raising the hatchet above their heads, they cut another notch which receives the opposite foot, and thus they mount our tall *Eucalyptus* with great celerity in a ziz-zag form. Once among the branches, they soon discover the hole of the animal, which they seize, and either kill and drop to their companions, or tuck under their girdle.

The small blue and buff Kingfisher is similar in its habits to the Laughing Jackass, but frequents the water as well as the land, and its note is shrill. The Red-shouldered Parrot comes from afar, and is here called the "Crimson-wing." The plumage is much the same in both sexes, though the cock is darker on the back; they are easily domesticated. The bird you call a "Small Bittern" is considered very rare here. I have never seen a second.

There are a great variety and very beautiful specimens of Dragonflies, particularly of the slender-bodied kind. Of these, though I have caught many, I have never been able to preserve them, for when dry the bodies always break off, and their brilliant colours invariably fade away and turn to a general brown.

Of Spiders there is also an infinite variety, some of them beautiful, others hideous. Those of the jumping sort are very numerous, I once was walking in the fields, and kicked over a clod, and in doing so disturbed a large brown spider. It appeared to me as if pitted with innumerable holes of a lighter colour than its general colour, but on stooping down to observe it, I found these supposed dots to be a numerous progeny completely covering the back of the mother. The affection of the spider for its egg-bag and young is very great, but I never before observed it so strong as for the parent to bear the weight of some fifties of sons and daughters on its back. It seemed thoroughly alarmed at being disturbed, but in following the bent of my curiosity I touched it with a stick and directly disturbed all its

young, which forsook the parent's protection and covered the ground. The poor spider was on this desertion quite motionless, apparently quite bewildered and heart-broken for the loss of her beloved family. I waited sometime but did not observe her collect a single young one.

We cannot without great trouble keep specimens in this country; they are so subject to a hairy grub, which finally turns to a small black-beetle, similar to those found in ham and bacon. I never observed before, but it strikes me as particularly curious, how many of our smaller birds are furnished with the brush tongue, and how well adapted it is to their habits: flitting about the blossoms they effectually extract the honey on which alone they seem to feed.

We have a pest in this country of the Tick kind; it entirely frequents thick, scrubby country, and is most annoying and fatal, if not discovered. It is, therefore, essential to look well over your dog's coat after you have been shooting in these brushes, otherwise you may lose him, for this tick has the power to destroy life. The symptoms in the dog are first excessive drowsiness, and as the insect sucks, weakness of the loins and spine, and finally death. In man, as I know, it is sufficiently disagreeable, though of course, seldom or never fatal. Its relations of several kinds I have seen in India, but they are harmless, though many dogs were glad to be relieved from them. It attacks calves, foals, and everything else, and generally contrives (how wonderful!) to fasten on some part of the body the animal is not able to get at.

Another curious incident occurred to me some time ago on the Manning River. I was on a visit to G. R., and his farm was girded by dense bushes; into them I went with my gun; the ground was several inches deep in decaying leaves and rotten wood. It had been and was very rainy weather, and no sooner was I under the shade of a bush than I was assailed at every step by Leeches, which made for my boots as fast as possible; I did not mind them at first, till some sticking on my ancles and legs warned me to be off. They were very numerous, of a light brown colour, with bright orange stripes from head to tail on the sides. The weather afterwards became dry; I went into the brushes again and not one was to be seen. There was not a cupful of standing water in the brush, though it was skirted by the river. I have never met with them since, probably from not going out in rainy weather when at home. On the Manning I was in a strange country, and was constantly out.

Through the spring and summer I nightly hear the coo-koo of the *Podargus Stanleyana*. I have never shot one or noticed them on the

prowl with any attention. I have seen them skimming along after dusk, but their favourite position where if undisturbed they will remain for a long time, is a thick tree, in which they are not easily discerned, though their loud note — *coo-ko*, is an infallible guide to their haunt. I never saw one in daylight — where they go to I know not—I have often come across owls but never this bird.

I shot a splendid owl the other night by mere chance. I wish I could describe him; however, if he will only keep till I send you a third box you will be able to judge. From some unaccountable noise which alarmed my wife in the middle of the night, I went outside with my gun, and noticed the wretch devouring my pigeons on the dovecot. He paid dearly for his gluttony, and perhaps the report of my gun was useful in other respects. I sat up till nearly daylight to skin him, and make sure of him, before the detestible flies were awake.

Butterflies are not to be found in the forest, and there is not a garden within eight miles of me. The large Lepidoptera I fancy are scarce, and only to be met with in large well-grown gardens, where the orange and lemon are cultivated. I have seen them only in such places. The few to be found about the uncultivated lands are principally of the Fritillary kind, brown or reddish, with black markings, and far from numerous in variety. There are also the small blue varieties seen among grasses. Moths are plain generally, I dare say there are plenty of them; but I have no liking to night-work in this country. A door or window left open here for the candle to attract them (the manner adopted by me in India to collect them) might bring something too large and strong for my cabinet. Independently of these difficulties, suppose them caught, it is hard to keep them from the attacks of other insects peculiar to such dead matter, particularly the hairy-grub already mentioned. It shows some tact in its attacks, always eating from underneath, so that it may not readily be observed, till the body is excavated and falls to pieces.

Last year I was sadly annoyed, and had my garden much destroyed by a small black-beetle: its hind-legs were formed for jumping. It came in myriads, settling principally on the rose-bushes and vines.

The young shoots were entirely eaten off, and many of the stems barked and killed. In a day a rose-bush would be leafless. I tried many ways to rid myself of this pest by shaking the bush, when they would fall as if dead to the ground. I collected them in heaps and destroyed numbers, and turned up the earth upon the rest. Lime and smoke had no effect apparently in lessening their numbers. They remained with me about a fortnight and were finally dispersed by one

of our heavy westerly breezes, which blowing for two or three days relieved me of their presence. Though I have seen the insect and sent it to you, I had no idea of its nature. It has not visited me this year; my neighbours, some of them old residents, never observed this insect to be mischevius. It is peculiar to low and swampy ground, and my house is adjacent to a large lagoon, which is subject to become dry.

An instance of courage in our domestic poultry occurred the other day, which was very amusing. A hawk attracted by some chickens, which had died and been thrown away, came down and settled on the ground. Immediately the fowls were in dismay, but recovering, marshalled themselves in order — the cocks in front, the hens and youngsters in a line behind. All advanced upon the hawk, and one cock, more bold than the rest, flew at him; this only made him rise a little and shift his position; but as he moved, so did the army of fowls, the cocks maintaining their place in the van, and spurring when they could, till at last they wearied out the patience of the hawk, and he left them supperless. Did not this combined attack show great instinct?

I skinned two native Kittens, (*Dasyurus*) yesterday; we dug the mother and three young ones out of a hole, but the dogs too much injured the old one. They are of a pale fawn-colour, spotted with white, similar to the hide of the axis. There is also another colour, though not so often seen, jet black with white spots; perhaps these are the males. They are most destructive in the poultry-yard, and though small, destroy many fowls in a night by sucking the blood and brains. War is always waged with them, but the best preventive is to chain a dog to the fowl-house. This animal is about a foot long, from the snout to the tip of the tail; slender in shape; sharp nose, and rounded erect ears, and when full-grown the tail is bushy. The young have very short hair and smooth tails, and are very tame, which cannot be said of the old ones. I handled and pulled the young ones about, and they never offered to bite, and I finally carried them home in my pocket.

C. H. HORSLEY.

List of Papiolionidæ and Sphingidæ occurring at Wansbeck, near Hamburgh.

Papilio Podalirius. In May, frequenting gardens and open fields. but is rare, shy and very difficult to capture.

P. Machaon. In May, some years abundant, about ditches, on walls, and in dried fields.

Pontia Cratægi. At Midsummer. About three years since this butterfly was very abundant in this neighbourhood, flying about lanes, fields, and ditches; it appeared particularly fond of the alder-tree, and was very easy to capture: since that time two specimens only have occurred.

P. Brassicæ, P. Rapæ, P. Napi. All of them too common.

P. Daplidice. In April and May, and again in August, common in dry fields, flies very fast.

P. Cardamines. In April and May, in meadows by hundreds.

P. Sinapis. In May and June, frequenting moist places, in woods, rather rare.

Colias Edusa. In August and September, frequenting fields of clover saved for seed.

C. Hyale. In July and August, frequenting the same localities as the last, but is abundant; it flies very rapidly.

Rhodocera Rhamni. Common throughout the year.

Melitæa Artemis. In May and June, frequenting meadows near woods, not uncommon.

M. Delia. In June and July; same localities, and equally common.

M. Cinxia. In June and July, in woods and meadows, scarce.

M. Athalia. From May to July, frequenting open places, in woods and meadows, in the vicinity of woods, not uncommon; this is a very variable species.

M. Dictynna. In June and July, in the same localities as the preceding, but less common.

M. Maturna. In June and July, in woods and neighbouring meadows, scarce.

M. Lucina. In June and July, open places in woods, not common.

Argynnis Euphrosyne. In May and again in August, or the latter end of July; common everywhere; a variable species.

A. Selene. In May and June, and again in August, abundant everywhere: last spring I captured a remarkable and beautiful variety, in which the black spots were united into bands or stripes.

A. Tomyris. A single specimen of this insect was brought me in July: I am not aware of the locality where it was captured.

A. Thalia. Its time is June and July: I have seen but a single specimen captured in the immediate neighbourhood.

A. Aglaia. In June, July, and August, common.

A. Daphne. I once captured this splendid butterfly in a lane in the Saxon forest flying about an oak-tree.

A. Dia. In May and again in July and August, in the open parts of woods, not uncommon.

A. Ino. During the whole summer, in woods: two years ago it was very abundant, but is now rather less so.

A. Lathonia. Extremely common throughout the summer.

A. Niobe. In June, July, and August, frequenting meadows near woods, not common.

A. Eris. I once captured this butterfly in a rich, damp, flowery meadow in this neighbourhood: all the entomologists here consider it a great rarity. Meigen states that it is quite unknown to him.

A. Adippe. In July and August, frequenting meadows by the sides of woods, abundant.

A. Paphia. In July and August, common everywhere.

Vanessa Atalanta. In summer and autumn, common.

V. Cardui. In July, August, and September, not uncommon in clover-fields.

V. Antiopa. In the spring, having hibernated: it reappears in August, September, and October, and is not uncommon, especially in the vicinity of yew-trees.

V. Urticæ. Common throughout the year.

V. Polychloros. Ditto.

V. Levana. In the spring: I only know of the capture of two specimens in this neighbourhood.

V. Prorsa. In August two years ago, I captured a single specimen of this insect in a friend's garden.

V. C-album. Common from spring to autumn, in fields, lanes, and gardens; a variable species.

Limenitis Populi. In June and July: this splendid butterfly frequents the open places in woods, and it is particularly fond of settling on moist spots of ground, where it may be easily taken when settled: I have found it in Reinbeck and Friedericksruh, and also in Niendorf wood.

L. Sibylla. In June and July, frequenting the open places in woods; it is particularly fond of oak-trees, and is easy to catch.

Apatura Iris. June and July, frequenting woods, and like the last, being partial to the oak: it sometimes flies so high as scarcely to be discernible; at other times it is very fearless, settling on moist places on the ground, and allowing one to take it with the hand.

Melanargia Galathea. In June, July, and August, frequenting dry, elevated meadows.

Maniola Hermione. In June, July, and August, frequenting dry, sandy heaths, and settling on the flowers of the wild thyme.

M. Semele. More common than the preceding, in the same localities, and at the same time.

M. Proserpina. Of this fine butterfly I possess a single specimen, taken in this neighbourhood.

M. Tithonus. In July and August, frequenting woods and meadows very common.

M. Eudora. In July and August, frequenting the same localities as the preceding, but not so commonly.

M. Janira. In July, common everywhere: a variable species.

M. Hyperanthus. In summer abundant: a variable species.

M. Ægeria. Common in our woods in summer.

M. Megæra. It occurs by thousands in meadows, &c., in the spring.

M. Medusa. In May and June, in woods, not common.

M. Pamphilus. In May, June, and July, common everywhere.

Maniola Arcanius. In June and July, common in woods.

Polyommatus Arion. In July and August, frequenting woods and fertile meadows, rare.

P. Euphemus. In July: I took a single specimen in a heathy meadow; it resembles the preceding, but is distinct.

P. Erebus. In August: a single specimen taken in a lane.

P. Janus. In July: this species is of the size of Arion, I captured it in a heathy lane.

P. Cyllarus. In May and June, frequenting open places in woods, and meadows in the neighbourhood of woods, but not common.

P. Acis. In summer, very common in meadows and woods.

P. Argiolus. In spring and summer, common everywhere.

P. Icarus. In summer, very abundant in meadows.

P. Argus. In summer, common everywhere.

P. Ægon. In June and July, not uncommon.

P. Circe. In May, and again in summer, not uncommon in meadows.

Lycæna Hipponoe. In June and July, not uncommon in woody meadows.

L. Chryseis. In June and July: I have captured many varieties of this insect near Reinbeck, in the Saxon forest, where it is no rarity.

L. Virgaureæ. In July and August, rare in dry meadows.

L. Phlæas. Common throughout the year.

Thecla Rubi. In May, frequenting meadows and lanes, very common.

T. Quercus. In June and July, near woods, but not common.

T. Betulæ. In August and September, very common in lanes and about ditches where there are alder-bushes.

T. Pruni. In June, not uncommon.

Hesperia Malvarum. In May, and again at the end of July, not uncommon.

H. Alveolus. In May and June, common everywhere.

H. Tages. Ditto.

H. Paniscus. In May and June, rare, occurs in Niendorff wood.

H. Comma. In summer; frequenting meadows, woods, and lanes, not uncommon.

H. Sylvanus. In summer, common everywhere.

H. Linea. Ditto.

H. Lineola. Ditto. — *A. Lamek*; *Wansbeck, near Hamburg, June, 1846*.

[This list is one of great interest to the English Lepidopterist: the latitude of Hamburg is the same as that of the middle counties of England, and the face of the country diversified like ours, with woods, meadows, and cornfields; yet, without any obvious cause, the number of species is at least a fourth larger than ours, and some which with us are of excessive rarity, are there *extremely* common: but if we make the comparison still more rigid, limiting our attention to any spot, as our correspondent has done to the vicinity of Hamburg, we shall find scarcely forty species or less than half the number our correspondent has enumerated.—*Edward Newman*].

Do Insects feel or do they not?—The question “Do insects feel or do they not?” having been recently discussed in the ‘*Zoologist*,’ I think it is not too late to offer a few observations on the subject, being, as it is, to entomologists, one of real and practical importance. On it depends entirely the *use* of seeking means for killing insects when captured as quickly as possible, or the utter *uselessness* of such research. And on it hang many of the arguments to which entomologists are so often exposed when de-

fending themselves against the too frequently unjust accusations of *cruelty*. There is a certain class who would object this accusation to us, not, because we are occasionally guilty of lengthening more than is needful our different processes of destruction,—but simply *because we are entomologists*. With such people as these, however, we utterly decline all argument. If they cannot comprehend that he who labours in so high a cause as that of Natural History, and makes it the study of his life to investigate the works of Creation, and, through his admiration thus obtained, to catch a glimpse of even higher things than these,—if they will not admit that *he* is free from the law of *cruelty*, what, from such people can we possibly expect? Why were all things in Nature made so beautiful, if it was not intended for us to investigate and profit by them? And how can we “investigate,” except by first *collecting* them? With men like these, therefore, we decline discussion. But there is another class who may oppose us on far better and more reasonable grounds. It is, simply, because some of us do not use the readiest and shortest means of putting our insects to death; for, I believe, no one will deny that many poor creatures, with unpractised entomologists, are often left hours, and even days, in a state of what *may* be torture, although, at the same time, I am well aware that there exist many people who would assert that it is *not*. This objection, consequently, is solely and entirely dependent on the question, “Do insects feel or do they not?” And it is this which we would now propose to discuss. The first query that arises in our mind, is this,—what are the means by which this point can be ascertained? It is useless to drag out long pages of probabilities and improbabilities, hypotheses and theories, all founded upon half-a-dozen isolated and miserable *facts*, which in all probability may have been actuated by a hundred external circumstances and local causes, which we cannot now ever expect to discover. For instance, what is the use of asserting that insects cannot feel, merely because Mr. John Smith (or anybody else) once went up to a moth while it was asleep upon a tree and stuck a pin through it without awaking it? Or what is the use of the assertion if he did this twice, three times, four times, or even a dozen times in his life? If he cannot prove that he can *always* do the same, his argument is utterly worthless: for, assuming (as he would) that insects do not feel, simply because, in the few instances before mentioned, they did not awake, how is he to pass over the millions of other examples of which those three or four were the *exceptions*? It is plain that he *cannot* pass over them; and that, therefore, if he cannot undertake *always* to go up to a tree and pierce a sleeping moth without disturbing its repose, his deductions from a few isolated instances like these are of no use whatever. Moreover, it is worth observing, that in every instance in which a moth in this predicament has been pierced, it is merely stated that it does not discover its unpleasant condition *at first*,—and yet, in spite of this, the conclusion, “that insects have no feeling at all,” has been more than once arrived at! In the extremely few successful instances which I have myself ever heard of, the insects awoke up in less than two minutes after they were pierced; so that, after all the labour of drawing superfluous deductions from such dubious circumstances, not one jot can be arrived at further than that the sensation of feeling is *extremely slow*,—and slower probably (as we might have naturally anticipated) when the insect is asleep to what it would have been had it been awake. Thus much, circumstances such as these might undoubtedly be said to prove,—but no more. How we are to assume from them “that insects do not feel,” is to me a mystery, since all that they can possibly assure us, is, that, when in a sleeping state, they *feel but slowly*. Other circumstances, such as their tardy circulation, may indeed tell us that they *always* feel

slowly ; and, in like manner, these may reasonably convince us, that, when in a dormant state, they feel *slower still*. But *feel at last* they most undoubtedly do ; and indeed we have no warrant for assuming that they do not feel *acutely*. The nervous system is undoubtedly the surest basis for our conclusions, and it is to it therefore that we must fly for the correctest knowledge of the present subject. It is that by which the whole Animal Kingdom is divided into five grand departments, and, to say the least of it, therefore, it is a surer footing for us to walk upon than the observations of a few isolated facts, which may be at any moment flatly and diametrically contradicted by the same number of facts of an opposite nature, provided they be equally isolated. It is easy enough to assume (as many people have done) that the struggles which insects, in an impaled condition, display, are not *the result of pain*, but merely struggles *to escape*. But why is such probable, and what right have we to assume it ? On what grounds do we take for granted, that animals which occupy a high position in the Zoological Kingdom,—whose nervous system is beautifully developed and calculated to carry sensation and feeling to all parts of the body,—which display a wonderful degree of instinct (we may say, in some instances, *intelligence*) and take a strange and noble part in the economy of Nature,—on what grounds do we assume that such animals as these are destitute of feeling ? Why was a nervous system given them, so fully developed and so wonderfully contrived, if they were ordained to be insensible to all external information and to be utterly incapable of enjoying the various states in which they are placed ? (For *if* they have no feeling, I assume that they are of course unable to “enjoy” their respective conditions). So far as my own opinion goes, I should have considered nervous matter (I believe it is called “neurine”) and feeling inseparable. And, moreover, where feeling exists, I contend that there must be an *extremity of feeling*,—*i. e.*, a *sense of pain*. It is unquestionably true that that “sense of pain” is greater as we advance higher in the Animal Kingdom, that is to say, according as the nervous system, by which sensation is conveyed to the central masses of neurine, is more and more completely developed. Yet to say that it does not exist *at all* (even in a modified degree), and that too in creatures more than half way up the whole Zoological Kingdom and occupying a high position in the third grand department (Homogangliata) of the Animal Creation,—is certainly to assume more than we have a right to do,—even had we no other natural causes to guide us than their external form and wonderful perfection. Had insects, in the general classification, fallen amongst the *Nematoneura*, more doubt as to their power of real feeling might have existed,—for, having in that case (as would have been true) merely nerves, properly so called, (*i. e.* in the form of strings or threads) by means of which intercommunication between the limbs could be carried on,—and having no central masses of neurine, existing in the form of brains, to which external intelligence could be especially conveyed,—the assertion “that they could not feel” might have been more pardonable. Nevertheless, even in *that* case, we should have no positive right for the assumption, for so long as nerves exist *at all*, it is impossible to deny that *feeling* exists also. Professor Rymer Jones, in speaking generally of the class of animals included under the great division Homogangliata, observes, “But as the brain, or ruling centres of the nervous system, become more largely developed (and consequently, more perfect in their structure), limbs of progressively-increasing perfection are gradually appended to the two sides of the body, until at last, *in the aerial insects*, we have creatures endowed with wonderful strength and energy, and gifted with senses and attributes of a very elevated character. Surely then we cannot possibly consider insects as destitute of

feeling, for there is nothing whatever to warrant, but everything to confute such an assumption. Are the old hacknied instances of moths (when asleep) pierced upon a tree appealed to? We have already answered them and shown that, unless this can *always* be done with the same result, (and I may here mention, that I have never been able to accomplish the feat myself) it proves not one jot in favour of the present argument. Are *other* facts, equally dubious and equally isolated, brought forward? It is at least a presumptuous thing to assume a grand law of Nature (and one of the greatest, in the Animal Kingdom, which we can conceive) from a few solitary facts,—“facts” which, were they solved, might probably be accounted for in a variety of ways, without conceding to so small and insufficient a “proof” what anatomy shows to be impossible, and what common reason and common sense, when looking on the subject in a broad light (with reference to the *other* departments of the Zoological Creation) alike pronounce to be, in the highest degree, unsatisfactory.—*T. V. Wollaston; Jesus College, Cambridge, June 30th, 1846.*

Sensibility of Insects.—The question concerning the degree of feeling which insects possess has lately been touched upon in the ‘Zoologist.’ Now, as far as I have been enabled to observe, they certainly appear “apathique,” as Lamarck calls them. Indeed, to suppose them endowed with feeling, involves considerations truly shocking to humanity. Whoever thinks of the caterpillar devoured by parasites, of the larva, &c. imprisoned by certain Hymenoptera, as food for their young, of the ferocity of combats protracted by tenacity of life (Zool. 1242) will see at once that if insects can feel, there is involved an amount of suffering perfectly unparalleled in the other departments of animated nature, and in my humble opinion, utterly discordant with the general system of the universe. To *superficial thinkers*, there may to be sure seem something contradictory in the idea of an apathetic animal; capable of feeling themselves, they infer that every living animal *must* feel likewise. This is just as logical as if some insect should indignantly maintain that man, on the same principle, must be able to fly, although devoid of organs for that function. Has any one pointed out nerves of sensation (not touch) in an insect? We often hear it said that insects feel in proportion as much as we, but no one could even tell me in proportion to what? To the range of their perceptions?—their rank in the system of Nature?—their degree of individualization?—or if we may venture so uncharitable a surmise, not surely to their size? Some naturalists have called the invertebrate animals somnambulists, *i. e.*, going through a certain round of actions without consciousness. Certainly they are little individualized, the species is everything,—the single insect nothing; indeed how could the ant and bee communities exist under other circumstances? Mr. Turner’s statement (Zool. 1342) of insects transfixed, only struggling at certain times, seems to me a most conclusive argument on our side. The insensibility of insects can, however, be no apology for killing or injuring them, except for scientific or economic purposes.—*J. W. Slater; Fairfield, June 6th, 1846.*

Treatment of Insects when captured.—I may add to the remarks on killing insects in your last number (Zool. 1334), that I have found the larger Lepidoptera are quickly and effectually deprived of life by placing them in a paper cone, and exposing them thus enclosed for a few moments to the steam of boiling water. I fold a piece of strong paper in the form commonly known as a sugar-paper, and place it with the moth, &c. enclosed, under the cover of a kettle or other vessel in which steam is copiously rising: its struggles are quickly over, and it is immediately ready for the setting board. Hemiptera, Hymenoptera, and Diptera are speedily killed by enclosure in

a bottle containing bruised laurel-leaves, or rather the young succulent shoots.—*William Clear ; Cork, May 5th, 1846.*

Treatment of Insects when captured.—I have noticed in the 'Zoologist' (Zool. 1334) an article on the treatment of insects when captured, it there recommends the use of a tin box with a sort of false bottom, the inner one to be perforated with holes, and some salts or ammonia placed between the two bottoms for killing the insects of the order Lepidoptera. I have tried it for a considerable time, and in most cases found the insect beat about a great deal too much, and likewise especially with the larger ones, they are very apt to recover. I have found that shutting them up in an air-tight brass box and putting the whole in boiling water is a very good plan. I have also, when the larger moths are stupified with ammonia transfixed them with a pin, and then running the pin through a rather large card, placed the point of the pin in a candle. In half or even a quarter of a minute, they are perfectly dead, without a struggle. I should feel obliged, if you think these observations worthy of a place in your next number, by your placing them there. I have had great pleasure in perusing the numbers of the 'Zoologist' ever since they came out first. I should be also glad if some more learned person than myself would inform me how *effectually* to destroy or keep out the mites from cabinets. I think I have tried almost everything that is possible to be done, and yet after a short time they will appear again.—*W. Sheppard ; Frome, May 5th, 1846.*

NATURALIST'S CALENDAR FOR AUGUST.

BIRDS.—Many of our summer birds leave us this month. The swifts usually depart in the first week, although a few stragglers may occasionally be seen till the end of the month. The warblers disappear gradually, as they have completed the autumnal moult. The young birds usually remain longer than the old ones, and the willow wrens and blackcaps may often be heard singing in low tones on warm days. Some of the waders, mostly young birds of the year, apparently on the way to more southern climates appear on our coast. The sanderling and turnstone are common, and the two little sandpipers (*Tringa minuta* and *T. Temminckii*) are occasionally met with. Grouse shooting begins on the 12th, and black game on the 20th.

INSECTS.—The red admiral butterfly (*Vanessa Atalanta*) is now very common, and may often be seen sucking the juice of plums and other kinds of fruit. About the 12th *Colias Hyale* appears; in some seasons in abundance, in others scarcely to be met with. The beautiful *Colias Edusa* appears rather late in the month, and continues through September. The convolvulus hawk moth (*Sphinx Convolvuli*) may occasionally be found resting upon gate-posts, palings, &c., or flying in the evening over flowers in gardens, particularly *Petunias*. The autumnal "thorn moths" (*Geometra Tiliaria*, *angularia*, and *erosaria*); the red underwing moth (*Catocala nupta*), the rare *Catocala Frazini*, *Graphiphora rhomboidea*, *Agrotis puta*, *suffusa*, and many other *Noctuæ* appear in this month. Most of the caterpillars of the *Sphingidæ*, or hawk moths, are now full grown, and preparing to assume the pupa state; those of *Sphinx Ligustri* will be found on the privet, ash, guelder rose, &c.; and those of *Deilephila Porcellus* feed upon the yellow ladies' bedstraw (*Galium verum*), in dry places, while the larvæ of *D. Elpenor* are found in marshes, on the buckbean and other plants, and sometimes in gardens, upon the various Fuchsias, apparently preferring the flowers. They vary exceedingly in colour.—*Henry Doubleday ; Naturalist's Almanack for 1845.*

Capture of Lepidopterous Insects in Scotland.— I have taken the following insects during the present summer:—

Anarta cordigera. On the 11th, 27th, 30th, and 31st of May, some of the specimens at rest on the ground amongst moss, which they much resemble, others flying very swiftly in the sunshine.

Acronycta Euphorbiæ. On the 27th of May, and on the 1st, 6th, 9th, 13th, and 15th of June, at rest on rocks in open moors.

Xylophasia rectilinea. On the 8th, 9th, 10th, 13th, and 20th of June, at sugar.

Mamestra splendens. On the 3rd, 8th, 9th, 10th, and 13th of June, at sugar.

Hadena satura. On the 20th of June, another, a fine female on the 2nd of July, both at sugar.

Cossus ligniperda. On the 2nd of July, at sugar.

Agrotis suffusa. At sugar, in plenty.

Graphiphora renigera. On the 3rd of July I took a female of this species, at rest on a window.

Harpalyce albo-crenata. Taken on the 1st of June, by beating; in my humble opinion, this is a very distinct species.

Anarta vidua has been very rare this season, and *Psodos trepidaria* has not occurred at all. — *Richard Weaver; Kinloch Rannoch, Perthshire, N. B., July 12th, 1846.*

Capture of Lepidoptera near Ambleside.— *May 30th to June 7th.*

Anchylopera fractifasciana. Common among short heather.

Lobophora sexalisata. One, hedge, flying.

Emmelesia trigonata. One, ditto.

Argyromiges Klemanella. One, beat out of a nut-bush.

Lophoderus subfascianus. One, beat out of bushes.

Anacampsis tricolorella. Three, beat out of bushes.

Eupithecia pusillata. Rather common, among grass.

Emmelesia albulata. Very common.

Anania octomaculata. Three, flying among flowers in a wood.

Heribeia Forsterella. Common, nut-bushes, flying.

Eupæcilia maculosana. Three, ditto.

Lampronia concumella. Common, ditto.

L. Seppella. One, ditto.

L. Calthella. Rather common.

Cidaria latentaria. Four, in rocky places.

Melitæa Euphrosyne. Two, flying by the road-side.

Apeloseitia rufipennella. Two, nut-bushes, flying.

Chrysochorys augustipennella. One, ditto.

Callisto Fyeslella. Plentiful, among rushes.

Xerene albicillata. Three, flying in a small wood.

Hepialus Hectus. Twenty, in the same wood.

Polyphasias silaceata. Two, flying among bushes.

Cochylis subroseana. Common among grass on the hill-side.

Argyrolepis Baumanniana. Three, flying among heather.

And several small things that are new to me; some of which I hope are entirely new.— *H. T. Stainton.*

Capture of Lepidoptera at Keswick.—June 8th to 10th.

Callisto Fyeslella. Common, among rushes.

Argyrosetia semifasciella. Three, beat out of nut-bushes.

Glyphipteryx subcuprella. Of this I fell in with a swarm, near the base of Skiddau, flying among brambles and dock plants, and secured nearly the whole of them.

Pyrausta cingulalis. One, heather, flying.

Adela De Geerella. One, flying among oaks.—*Id.*

Capture of Lepidoptera in Scotland, near Kilmun.—June 13th to 17th.

Hipparchia Polydama. Common among grass and heather, on the top of the hill.

Militæa Selene. Common, on the hill-sides.

Emmelesia blandiata. One, heather, flying.

Anthrocera filipendulæ. Common, among the heather.

Euthemonia Russula. Common, flying among fern.

Hepialus Velleda. Common, among the heather.

Spilonota Pflugiana. Three, among bushes.

Semasia fulvana. Four, among rushes.

Sericoris quadrimaculana. One, among grass.

Platypteryx cultraria. One, flying, among bushes.

Thyatira Batis. Nine, at sugar.

Acronycta Rumicis. Common, sugar.

Hadena gemina. Ditto.

H. adusta. Ditto.

H. plebeia. Ditto.

Agrotis suffusa. Two, ditto.

Euplexia lucipara. Common, sugar.—*Id.*

Notes of the capture of Lepidoptera in the vicinity of Lewes.

Deilephila lineata. A male at rest in a turnip-leaf, in a garden at Upper Beddingham, near Firle, March 1st. A female at rest in a garden at South Malling, Lewes, April 7th.

Crambus cerusellus. Sweeping on the Downs, June 20th.

Ino Globulariæ. Sweeping on the Downs, June 21st and 22nd.

Pterophorus tetradactylus. Ditto ditto.

Hemithea vernaria. Flying at dusk, June 21st to 29th.

Harpalyce galiata. Flying at dusk, June 23rd to 28th.

Anticlea rubidata. Ditto ditto.

Xylophasia sublustris. Sugar, June 23rd to 29th.

Synaphe angustalis. Sweeping the Downs, June 24th.

Harpalyce sylvaticata. Flying at dusk, June 24th to 29th.

Acronycta ligustri. Sugar, July 25th and 27th.

Acosmetia arcuosa. Flying at dusk, July 1st.

Nudaria mundana. Ditto June 1st to 7th.

Pericallia syringaria. Ditto, June 4th.

Ceratopacha duplaris. Ditto, ditto.

Pterophorus lithoxylodactylus. Ditto, June 7th.

Of *Xylophasia sublustris* I have duplicates, which I shall be happy to send to any gentlemen who may desiderate them.—*P. Jenner Weir* ; 17, Grosvenor Park North, Camberwell.

NATURALIST'S CALENDAR FOR SEPTEMBER.

BIRDS.—Most of the migratory birds are now moving towards the equator. The greater portion of the summer visitors have left us, but a few remain; and the wheat-ear and lesser pettychaps may sometimes be seen quite to the end of the month. Swallows and martins, which tarry here much longer than our other summer birds, now congregate in vast flocks, the former seeming to prefer trees for their meetings, and the latter the roofs of houses. At this period many song thrushes arrive in small flocks from the northern parts of Europe, and after remaining a short time, seem to journey on to more southern climes. They mostly appear a short time before the redwings, which seldom arrive till the latter end of the month. Small parties of ring ousels visit the southern counties of England, on their way to warmer climates, from the breeding stations in the north of England and Scotland. During their stay they feed upon the berries of the yew and mountain ash. The elegant gray wagtail also quits its northern haunts, and may be found by running water during the winter, in most of the southern counties. The various finches now congregate in large flocks, and it is at this season that such large numbers are taken by the London bird-catchers.

INSECTS.—In this month the beautiful tribe of moths denominated “buttons” (*Peroneæ*) appear. They are tolerably common in the New Forest, and other wooded districts, and are either extremely variable, or the species are very numerous, but it is more probable, that when they are better understood, the genus will be found to consist of a few variable species. Many of the *Noctuæ* may now be taken, and among them *Calocampa vetusta*, an insect till recently considered extremely rare; *Orthosia pistacina*, one of the most variable of insects; *O. lunosa*, *O. litura*, and *O. macilenta*. Some few *Geometræ* may be found, such as *Larentia cervinaria*, *Triphosa dubitata*, &c. During this month most of the caterpillars of the “prominent moths” may be found at their full growth; those of *Leiocampa Dictæa* and *Notodonta Ziczac* on willows and poplars, and those of *L. dictæoides* and *N. Dromedarius* on the birch. — Henry Doubleday; *Naturalist's Almanack for 1845*.

Appearance of Colias Edusa in the Isle of Wight.—As the constant or periodical recurrence of *Colias Edusa* may still be regarded as an unsettled question with some of the readers of the ‘*Zoologist*’ who incline to the old opinion of a triennial interval between its visitations, and a total suspension or nearly so of its appearance during that space of time; I can again, as on a former occasion, (*Zoologist* for January, 1845) add my testimony to that of such correspondents as may probably communicate the result of their experience in some forthcoming number of this journal, in proof of its annual advents in some parts at least of the country. I first saw *C. Edusa* on the wing this summer, July 3rd, since which time up to October 29th I have repeatedly remarked it in different parts of the island, increasing in frequency with the advance of the season, though by no means abundant. I speak within bounds in saying that I have observed a score or upwards within these four months, a small number compared with even that of last year, which was not the epoch of maximum production. My friend the Rev. J. F. Dawson has remarked the individuals produced this summer to be paler than usual, and I myself captured a specimen of the white or rather sulphur-

coloured variety (the *C. Helice*, of Haworth), which I had not previously met with in this island.—*William Arnold Bromfield ; Ryde, Isle of Wight, October 30, 1845.*

On the periodic appearance of Colias Edusa at Charmouth, Dorset.—The subject of the periodic appearance of certain insects is one of great curiosity and interest; it is also one of much difficulty, and a vast mass of evidence should be collected before anything like absolute conclusions should be drawn or positive assertions made. It will cause me much pleasure if the following rough, and I much regret to add, imperfect notes shall tend, in however slight a manner, to increase the amount of statistics absolutely essential for arriving at any definite result in the case of the insect above-named. I may state that I have known the locality for nearly twenty years, and certainly very few of those years have passed without some specimens having either been seen or captured. One year they will appear in profusion, and then for several years they will only be seen in small and variable numbers, and then again they will show themselves in great abundance. I much regret that I have not kept notes of all these appearances in that locality, as some useful result might then have been arrived at, by the observations extending over so many years. Before commencing the dates of its occurrence at Charmouth, I will just state that one of my brothers captured a single specimen near Worcester in 1825, where it was considered at that time a rarity. The first time I captured *Colias Edusa* at Charmouth, was in September, 1826, and it was then in very great abundance. The next note I have of its appearance is in 1833 in September. The next is the 2nd of October in 1835, but in limited numbers. Then in 1836 from the end of August to the middle of September I took twenty-three specimens. In 1844 one of my brothers took and saw a very considerable number; and this present year I was there the last week in August and the first in September and saw one or two specimens, but my brother had seen some more, probably a dozen, about ten days previously. For the last ten years I have been only very occasionally at Charmouth, but I know that specimens have been taken in greater or less abundance almost every year, though I have no positive note of the fact. I have with some little trouble drawn out a table with all the dates of its occurrence since 1804 to the present time that I could collect, but I have been unable to fix upon any series of years in which it has been particularly and generally abundant. I have obtained negative as well as positive evidence to some extent, but am at present unable to lay down any rule as to the probable time of its appearance. I shall, however, endeavour to enlarge the number of data, and should I be able from them to arrive at any certain conclusions, I will not fail to record them in the pages of the 'Zoologist.'—*Beverley R. Morris ; Beverley, December 30th, 1845.*

Extraordinary migration of Butterflies.—As instances of the migration of butterflies are not I believe of very common occurrence, the following notice of the invasion of the Kentish coast by a vast flight of the garden white butterfly from France, may be worthy of notice. On the 7th of July (Tuesday) I was surprised at the very unusual number of white butterflies which appeared in our garden here, and in order to protect the rising generation of cabbages and broccoli, I commenced an attack upon them with my net. In about an hour I killed upwards of a hundred, but this not appearing to materially decrease their numbers, I desisted from the work of destruction. The next day they were as numerous, and I began to suspect that they had migrated hither, as it was difficult to account for so simultaneous an escape from the chrysalis state of so vast a number in our immediate neighbourhood. I have since been informed that on Sunday the 5th of July, an extraordinary flight of white butterflies arrived at

Dover from the French coast. It was described as being so extensive as to pass like a cloud of snow. The decks of several vessels were covered with them. They came in a south-west direction, and as the wind was not blowing at the time they were enabled to reach the shore in safety, from whence they were speedily driven inland by the rising of the wind soon after their arrival. There is no doubt, therefore, that the influx of butterflies which appeared at Kingston on the Tuesday morning formed part of the flight which arrived at Dover on the Sunday previous. The wind being against them will account for the length of time they took to travel to Kingston, which is distant only ten miles from Dover. They might also have required rest after their trip across the Channel. The great majority of those I caught were the small garden white (*Pontia rapæ*). The specimens of *Pontia brassicæ* flying at the time, did not exceed the number generally seen at this season of the year; nor have I since observed any increase in their numbers, although the former is still everywhere to be seen in unusual abundance. More than three quarters of those which I killed were females, and there can be but little doubt that the cause of their migration hither was caused by a foreseen lack of food that would be necessary for the supply of the wants of the immense offspring which such vast multitudes would produce, and that they were, therefore, led by that instinct, the force and power of which we know so little, to seek in another country that necessary provision for their progeny which they lacked in their own. Perhaps the late extraordinary mild winter may in a measure have been the cause of so great an increase in their numbers, as to render it necessary for them to send a colony to England, as in Kent the caterpillars of this very butterfly fed during most of the winter months in considerable numbers on the broccoli and cabbage in our gardens. Much as I admire the instinct which guided them here, I by no means approve of the object of their visit, as already the cabbages, broccoli, savoys, and the whole of that tribe of plants, begin to show evident tokens of it, and I fear in some instances the crop will fall a sacrifice to the ravages of their caterpillars.—*J. Pemberton Bartlett; Kingston Rectory, July 16th, 1846.*

Extraordinary flight of Butterflies.—One of the largest flights of butterflies ever seen in this country, crossed the Channel from France to England, on Sunday last. Such was the density and extent of the cloud formed by the living mass, that it completely obscured the sun from the people on board our continental steamers, on their passage, for many hundreds of yards, while the insects strewed the decks in all directions. The flight reached England about 12 o'clock at noon, and dispersed themselves inland and along shore, darkening the air as they went. During the sea passage of the butterflies, the weather was calm and sunny, with scarce a puff of wind stirring; but an hour or so after they reached *terra firma*, it came on to blow great guns from the S.W., the direction whence the insects came.—*Canterbury Journal.*

Death's-head Hawk-moth at Sea.—A fine specimen of this insect flew on board the *Atalanta* steamer when off the Casket Rocks on the 30th of May.—*Arthur Benington; Swansea, July 7th, 1846.*

Death's-head Hawk-moth, at Barton-on-the-Heath.—I beg to record the capture of a very fine and perfect specimen of this insect. It was taken on the 6th of May last, creeping up a beech tree on the estate of the Rev. J. Scholefield, at Barton-on-the-Heath, Warwickshire, (about six miles from this town). This insect appears to come forth at very different times of the year, more generally, I believe, after Midsummer. It is rarely taken in this neighbourhood. The late appearance of butterflies this season has been rather remarkable. The first specimen I saw was a small white

(*P. rapæ*) on the 3rd of May, whereas last year, when crossing a considerable tract of the county a few miles from Oxford, on a beautiful day in April, I was surprised to see, I think more than a hundred specimens, including the large and small tortoiseshell, the brimstone, one or two peacocks, and a few whites. From the mildness of last winter, one would have expected early and abundant broods; they are now however, those species usually affecting this neighbourhood, tolerably plentiful.—*T. Goatley; Chipping Norton, Oxon, June 8th, 1846.*

Convolvulus Hawk-moth at Stanford Rivers, Essex.—Seeing several notices in the 'Zoologist' of the recent occurrence of this moth near London, I thought, perhaps, its capture might be important enough to merit a place in your periodical. I am possessed of two specimens which were found in the early part of September, 1844 and 1845, flying about cottages in the village, being I suppose attracted by the light, and which were brought me by their respective captors. One is rather rubbed by its attempts to escape from its imprisonment, but the other is in fine condition.—*I. Taylor, jun.; Stanford Rivers, Essex, July 4th, 1846.*

Occurrence of Deilephila Livornica near Cork.—I observed in the May number of the 'Zoologist' a notice by Mr. S. Stevens of the capture of *Deilephila Livornica*, and I have to record that two specimens of this beautiful and rare insect were also taken in the neighbourhood of this city in April last, and are now in my possession. I am not aware that this insect had previously occurred here.—*William Clear; Cork, May 5th, 1846.*

Capture of Lepidopterous Insects in the Isle of Wight.—I learn from G. Guyon, Esq., that two, if not more specimens of *Acherontia Atropos* have been captured at Ventnor this spring, in addition to which about the same number were taken last autumn at Steephill, in the immediate vicinity of that rising watering place.

Deilephila Livornica. A specimen of this rare hawk-moth was also taken at Ventnor in April or May of the present year, as I am informed by Mr. Guyon, and was seen by the Rev. J. F. Dawson, being the second instance of the occurrence of the species in the Island (Zool. 803), which seems to have appeared in comparatively greater numbers within these last two years in other parts of the kingdom than it has ever done previously. When much rubbed in captivity, its resemblance in size, form, and style of colouring to *D. Galii* may originate doubts of its identity, but if I mistake not the greatly larger and more prominent eyes, which are like those of *D. Celerio*, will always distinguish *D. Livornica* from its near relatives *D. Galii* and *D. Euphorbiæ*.

Acronycta Alni. The larva was brought to me in August last, found feeding on the sycamore maple at St. John's, near Ryde, but effected its escape from the breeding-cage before changing to the pupa state.

Stauropus Fagi. A caterpillar of the lobster moth was brought at the close of the autumn of 1845 to the Rev. — Hannay, of East Cowes, of which he showed me a correct drawing in April last, the specimen being then in chrysalis.—*William Arnold Bromfield, M.D., Ryde, June 8th, 1846.*

Capture of Hadenæ rectilinea.—Another specimen of this fine insect was taken by John Dawson, Esq., in Torwood, at sugar, on the 9th of June.—*H. T. Stainton; Lewisham.*

Immense swarm of Gnats.—On the 3rd of July I saw what I took to be a cloud of dust or volumes of dark brown smoke rising from a field: on approaching the spot the appearance had vanished, but the surface of the ground was literally covered with small insects with short wings.—*Thomas Webster; 96, Ormond Street, Manchester.*

Description of the British species of Bees belonging to the genera Chelostoma, Heriades, Ceratina, Eucera, Panurgus, and Anthidium ; with Observations on their Economy, &c. By FREDERICK SMITH, Esq.

Genus.—CHELOSTOMA, Latreille, St. Fargeau.

Apis, Linnæus. *Hyleus*, Fabricius. *Trachusa*, Jurine.

Body elongate: maxillary palpi minute, 3-jointed: labial palpi 4-jointed: fore-wings with two complete sub-marginal cells.

SP. 1. CHELOSTOMA FLORISOMNE, Latreille.

Female.—Length 4—5½ lines. Black, thickly and finely punctured; head subquadrate, the mandibles very prominent and ciliated within with ferruginous hair, on each side of the clypeus a patch of whitish hair; the antennæ clavate; the cheeks thinly clothed with ochreous hair, as well as the sides of the thorax which is ovate; the apical margin of the wings brown; the posterior tarsi clothed within with ferruginous hair; the abdomen cylindric, all the segments above have a white marginal fascia, the first generally interrupted; beneath densely clothed with pale yellow hair.

Male.—Length 4—5 lines. Black, thickly punctured; the face densely clothed with pale yellow hair, the mandibles acutely bidentate, ciliated beneath with long ochraceous hair, the cheeks terminating in an obtuse tooth or prominence at the base of the mandibles; the intermediate joints of the antennæ angulated beneath; the thorax thinly clothed with pale yellow hair; the margin of the wings brown; the tarsi beneath clothed with yellow hair, the calcaria testaceous; the abdomen linear, incurved, and bidentate at the apex; the margins of the segments ciliated laterally with pale yellow hair; beneath, the second segment forming a stout prominence, concave above, the fourth segment is deeply concave and clothed with bright yellow hair, the apical segment is recurved and bidentate.

This is the only species of the genus hitherto discovered in this country, the *Apis maxillosa* of Linnæus being the female, and his *A. florissomnis* the male. This bee is very abundant; I have received it from the Isle of Wight, and from Scotland, and have captured it myself in Yorkshire; it forms its burrows in old posts, rails, &c.; and it is by no means an uncommon circumstance to find large colonies

established in such situations. I have had no opportunity of tracing the economy of the species, but there is an interesting account of its habits in the first volume of the 'Entomological Magazine.*' It is there detailed in substance as follows; the female having fixed upon a post or other object suited to her purpose, she first perforates to the depth of an inch or more in a horizontal direction, then, changing her course, she works in a perpendicular one until she has constructed a tube twelve or fourteen inches in length; she then changes the direction of the tube to the horizontal, and continues it to the outside of the post; she then forms her first cell at the bottom of the tube, and having stored it with pollen and honey she deposits an egg and closes it up; a succession of these cells is constructed to the number of a dozen or more, when having finished her task, she closes up both ends of the tube, the lower one with fine particles of agglutinated sand, but the top she secures by the addition of some small pebbles, &c. for greater security; when the bees are fully developed, they are said to make their escape from the lower end of the tube, those eggs which were deposited first being *necessarily* the first to arrive at maturity. This is in exact accordance with the history of *Xylocopa violacea*, as detailed by Reaumur. These histories are remarkable, inasmuch as they are directly opposed to my own observations on every species of bee which I have had an opportunity of observing. I have invariably found that about half of the number of eggs, those first deposited, produced females, the rest in the upper cells being males, and these always come forth a few days before the females;—this is the history of *Megachile Willughbiella*, of *Osmia leucomelana*, *O. bicornis*, *O. bicolor*, and *O. tunensis*, and also of *Sarapoda bimaculata*; the same will apply to several of the fossorial Hymenoptera, as *Crabro cephalotes*, *C. dimidiatus*, *C. Xylurgus*, and *Rhopalum rufiventris*. I cannot but suspect that there is some mistake in the details quoted, and a circumstance which I observed some years ago, tends to confirm me in my suspicion; being at that time on an entomological excursion in Hampshire, my attention was attracted to some bees which I observed entering the straws of the thatch of a barn; these proved on capture to be *Chelostoma*; I did not find more than five or six cells in one straw, in some of which was a small larva feeding, the cell first formed being close to the first knot in the straw; in this instance I cannot conceive but that the first bee that would emerge must be from the cell nearest to the entrance of the tube, the cell last stored;

* Ent. Mag. i.

but I regret that I did not at that time avail myself of so favourable an opportunity of tracing the history of the bee. Observation has proved to me that the egg first deposited is not *necessarily* the first to arrive at maturity; and it must be observed, that in the instance of *Xylocopa*, and also of *Chelostoma*, excavating in an upright post, the insect is necessitated to make an outlet both at the top and bottom, at the latter for the purpose of getting rid of the sawdust as she proceeds upwards, and at the former as an entrance when she is forming her cells, and depositing the food for her young brood.

Genus.—*HERIADES*, *St. Fargeau*, *Spinola*.

Apis, Linnæus, Kirby. *Trachusa*, Jurine. *Anthidium*, Panzer.

Body elongate: maxillary palpi 2-jointed: labial palpi 3-jointed, the second joint being very long: fore-wings with two complete sub-marginal cells.

Only two species of this genus have hitherto been discovered in this country; the *H. truncorum* and *H. campanularum*: the first of these is the type of the genus; it is the *Apis truncorum* of Linnæus, an authentic specimen of which insect is preserved in the Linnean cabinet.

SP. 1. *HERIADES TRUNCORUM*.

Female.—Length $3\frac{1}{4}$ lines. Black, coarsely punctured; head as large as the thorax, mandibles carinated above, and acutely bidentate; a patch of whitish hair on each side of the clypeus; the cheeks at their extreme inner margin bidentate; the thorax thinly clothed at the sides with white hairs; the wings fuscous, the basal joint of the posterior tarsi clothed beneath with reddish yellow hair; the abdomen cylindrical, the base concave, with a transverse carina along the upper margin; all the segments have a narrow white marginal band, the first generally interrupted, the apical segment thinly clothed above with short pale yellow hair, the abdomen beneath densely clothed with reddish yellow pubescence.

Male.—Length 3 lines. Black, coarsely punctured; the cheeks unarmed, the face clothed with pale yellow hair; the antennæ filiform, nearly as long as the head and thorax; mandibles not carinated; the thorax thinly clothed with pale hair; the abdomen inflexed, concave at the base, the first and second segment have a narrow white marginal

band, the apical segment compressed, with a deep transverse fovea on each side; beneath, a longish fringe of white hairs on the margin of the first and second segment, the apical segment deeply concave.

This species has hitherto been rare in cabinets; there is a specimen of each sex in the Kirbyan cabinet, taken by Mr. Trimmer near Hammersmith, where I have myself frequently searched for it but without success: it no doubt, like its congener, nidificates in decaying posts and rails, and therefore whole colonies will be destroyed occasionally when such are replaced by sound timber. I detected three specimens of the female amongst a mass of unarranged bees in the possession of Mr. Ingall, and one I obtained from a collector, captured in Hainault Forest: I have not met with the species myself. The other species, the *H. Campanularum*, is abundant in many situations; I have met with large colonies in posts, rails, &c.; it is also to be met with, as Mr. Kirby observes, in the flowers of various species of *Campanula*.

SP. 2. *HERIADES CAMPANULARUM*.

Female.—Length $2\frac{1}{4}$ — $2\frac{1}{2}$ lines. Black, thickly and finely punctured; the mandibles bidentate, ferruginous at the apex; the antennæ clavate; the thorax has a slight hoary pubescence at the sides; the wings slightly fuscous; the abdomen cylindric, the apical segment very finely and thinly clothed with pale hair; beneath densely clothed with pale yellow hair.

Male.—Length 2 — $2\frac{1}{4}$ lines. The antennæ filiform; the face below the antennæ clothed with pale yellow hair; the thorax has a thin scattered pale pubescence, and the wings are slightly fuscous; the abdomen inflexed, acutely bidentate at the apex; beneath, the second segment is elevated into a tubercle, and the fifth is deeply concave and clothed with pale hair.

Genus.—*CERATINA*, Latreille, *St. Fargeau*.

Apis, Linnæus, Kirby. *Megilla*, Fabricius. *Pithitis*, Klug.
Clavicera, Walcknaer.

Body elongate: antennæ subclavate: maxillary palpi 6-jointed; labial palpi 2-jointed: fore-wings with three sub-marginal cells.

Only one species of this genus has been discovered in Britain.

SP. 1. *CERATINA CÆRULEA*, Latreille.

Female.—Length $2\frac{3}{4}$ — $3\frac{1}{4}$ lines. Shining blue or blue-green,

deeply and closely punctured, nose and mandibles black, antennæ piceous; the thorax has a central longitudinal channel, and a slight parallel scratch on each side; the tegulæ piceous; wings fuscous; abdomen clavate, the margins of the first and second segments slightly depressed, the apex obtuse.

The *male* closely resembles the female, but the labrum and clypeus are white, and the apical segment terminates in a bifid mucro; the sixth segment has a central elevated carina; beneath, the margins of the segments are piceous.

This species has by most authors been considered a parasitic insect. Such was the opinion of St. Fargeau, but M. Spinola published a memoir upon the genus, in which he states that they excavate bramble-sticks, &c., and provision their own nests, and Mr. Thwaites has carefully traced their economy; he found them in bramble-sticks, each stick containing the bee in various stages of development up to the pupa. Since I received a communication from Mr. Thwaites upon the subject, I have myself bred the insect. I observed the parent-bee enter a bramble-stick; after securing the bee I cut off the stick, and upon examining it, I found only two cells completed, which subsequently produced each a female *Ceratina*. I have observed *Ceratina* entering sticks excavated by *Osmia leucomelana*, and think it probable that she sometimes makes use of a ready-made burrow, coating it and adapting it to her purposes; such occurrences have been observed, as in the case of *Megachile centuncularis*, recorded by Mr. Newport, in which the bee filled up all the crevices, &c. in a hole which she selected between the bricks of a garden-wall. *Osmia bicornis* has been found to select the lock of a garden-gate, and I have above mentioned the instance of *Chelostoma* selecting the tubes of straws. *Ceratina* being destitute of polleniferous organs, has led theorists to class this genus amongst the parasites; but observation proves that structural differences are insecure guides in theorising upon the economy of insect life.

Genus.—*EUCERA*, *Scopoli*, *Fabricius*, *Panzer*, *Rossi*, *Spinola*.
Apis, *Linnaeus*, *Kirby*, *Geoffroy*. *Trachusa*, *Jurine*.

Labial palpi 4-jointed; maxillary palpi 6-jointed: antennæ of the male as long as the body: fore-wings with two complete sub-marginal cells.

Only one species of this genus has been discovered in this country, the *Apis longicornis* of Linnæus. There are four enumerated in the British lists; *Apis linguaria* of Kirby is a small, long-disclosed specimen of *Eucera longicornis*; of this I have satisfied myself beyond a doubt, having visited an extensive colony on many occasions for some years. I have found the males differ considerably in size, and the original colour of the pubescence, a rich fulvous brown, changes gradually by exposure to cinereous or gray. The third Kirbyan species, *A. pollinaris*, a female, is a well-known North-American insect; the specimen which Mr. Kirby described is still in the Banksian cabinet. The fourth species, *A. Druriella* of Kirby, is also a foreign insect; I have seen it in several collections, but do not know its precise locality.

SP. 1. *EUCERA LONGICORNIS*.

Female.—Length $6\frac{1}{2}$ — $7\frac{1}{2}$ lines. Black; the face clothed with short pale fulvous hair, and the labrum with fulvous; antennæ not so long as the head and thorax; the thorax densely clothed above with a rich fulvous pubescence, on the sides and beneath it becomes a very pale yellow; the tegulæ ferruginous; the apical margins of the wings tinged with brown, the nervures ferruginous; all the legs above have a fulvous pubescence; the posterior tibiæ and first joint of the tarsi have a bright fulvous pubescence; the calcaria testaceous, tarsi beneath ferruginous, the claws rufous, tipped with black; abdomen broad, closely and minutely punctured, the basal segment thinly clothed with pale fulvous hair, the second and third at the extreme lateral margin, and the fourth entirely clothed with a silvery white pubescence, the fifth with fulvous, and the sixth with ferruginous hair, with a bare patch in the centre; beneath, one or two of the apical segments have a marginal fringe of pale fulvous hair.

Male.—Length 6—7 lines. Black; clypeus and labrum yellow, the face has a fulvous pubescence; the antennæ as long as the entire insect; the thorax fulvous above; the legs have also a fulvous pubescence, as well as the two first segments of the abdomen, the third and fourth have a short thin black pubescence, the apical segments fulvous.

Eucera longicornis is a local, but extremely abundant insect in some situations. It forms its burrows about six or eight inches deep in a stiff clayey soil, and the larva spins a brown tough cocoon; in some cells I have found its parasite the *Nomada sexfasciata*; the perfect insect appears usually about the last week in May. It is very

amusing to watch the males chasing one another with the greatest rapidity, while skimming over the surface of the ground in multitudes; occasionally one will seize another, when both fall to the ground, rolling over and over in a sportive struggle, again they separate and rejoin their sportive companions. The flight of the male is exceedingly graceful, it is performed in a series of undulating circumvolutions exceedingly interesting to observe, particularly when large numbers are assembled.

Genus.—PANURGUS, *Panzer, St. Fargeau.*

Andrena, Panzer. *Trachusa*, Jurine. *Eriops*, Klug.

Philanthus, Fabricius. *Apis*, Kirby.

Antennæ sub-clavate in both sexes: mandibles long acute, not dentate: labial palpi 4-jointed: maxillary palpi 6-jointed: fore-wings with two complete sub-marginal cells.

Only two British species have been discovered: they are local insects, but yet abundant where they occur in July and August.

SP. 1. PANURGUS URSINUS.

Apis ursinus, Gmelin (*Systema Naturæ*, p. 2790), Kirby, *male*.

Apis Banksiana, Kirby, *female*.

Female.—Length $5\frac{1}{4}$ lines. Black, shining; head with a black pubescence, the antennæ dark piceous, nearly black; tips of the mandibles piceous; thorax, the tegulæ piceous; the wings slightly fuscous, darkest at their margins, all the tibia and tarsi clothed with fulvous hair, the posterior pair densely so, the calcaria fulvous; the tip of the abdomen tufted with brown hair.

Male.—Length 5 lines. Black; shining, with a thin scattered black pubescence; wings as in the female; the tibiæ and tarsi have a thin fulvous pubescence, the calcaria and apical joints of the tarsi fulvous, the margins of the abdominal segments depressed, the apex bilobed.

Panurgus ursinus appears to be much more generally distributed than the smaller species, *P. calcaratus*; on Hampstead-heath it is very plentiful in July. I have generally met with it on heaths.

SP. 2. PANURGUS CALCARATUS.

Apis calcaratus, Scopoli. *Andrena lobata*, Panzer.

Apis ursina, var. β . Kirby, *female*. *Apis Linneella*, Kirby, *male*.

Female.—Length 3—4 lines. Black, shining, thinly clothed with black pubescence; the antennæ beneath, and the apical joints entirely rufo-piceous, tips of the mandibles ferruginous; thorax, wings hyaline; the anterior and intermediate tibia and tarsi thinly, and the posterior densely clothed with fulvous hair, the calcaria and apical joint of the tarsi ferruginous; the margins of the abdominal segments depressed, the apex tufted with brown hair.

Male.—Length 3—3 $\frac{1}{4}$ lines. Black, shining, with a thin black pubescence; head large, wider than the thorax, sometimes half as wide again; antennæ rufous, with the base black, tips of the mandibles ferruginous; thorax, tegulæ piceous, wings hyaline, nervures rufo-piceous; the legs nigro-piceous, the posterior femora clavate, with a stout obtuse tooth beneath; the margins of the abdominal segments depressed, the apical segments are tufted laterally with brown hair, the apex bilobed.

Panurgus calcaratus I have met with at Charlton, also at Darent in Kent, plentiful at Weybridge, and on several heaths in Hampshire; they frequent different species of dandelion (*Leontodon*). Their burrows are from six to eight inches deep, generally constructed in a firm sandy soil: it is very partial to a hard trodden pathway. They store up a mass of pollen and honey similar to the *Andrenidæ*.

Genus.—ANTHIDIUM, *Fabricius*, *St. Fargeau*.

Apis, Linnæus, Kirby. *Trachusa*, Jurine.

Antennæ filiform: mandibles with four or five teeth: maxillary palpi 1-jointed, labial palpi 4-jointed, the two apical joints minute: forewings with two complete sub-marginal cells. There is but one British species known.

SP. 1. ANTHIDIUM MANICATUM.

Female.—Length 4—5 $\frac{1}{2}$ lines. Black, punctate; mandibles yellow, black at their tips; the face below the antennæ yellow, with the base and centre of the clypeus black; the labrum denticulate, a yellow spot on the vertex above the eye; the thorax has a pale yellow pubescence at the sides, becoming nearly white on the metathorax and beneath, a yellow spot on the tubercles and tegulæ; the legs have

an orange-yellow pubescence on the tarsi, which sometimes changes to nearly white; a yellow stripe down all the tibiæ, or at times only a spot at their base, in some instances quite obsolete; the intermediate and posterior tibiæ more or less rufo-piceous above at their apex; the segments of the abdomen have an ovate lateral yellow spot, those on the fourth and fifth frequently extending inwards, forming elongate yellow stripes; the abdomen beneath densely clothed with orange-yellow pubescence.

Male.—Length 6—8 lines. Black, punctate; mandibles yellow, black at their tips; the face below the antennæ yellow; the base of the clypeus more or less black, a yellow spot on the vertex above the eyes; a silvery white pubescence on the face; the thorax has a thin yellow pubescence above, becoming silvery white beneath, two yellow spots on the tegulæ, and the wings fuscous; the anterior and intermediate tibiæ more or less yellow at their base and apex, the posterior tibiæ have also sometimes a spot at the base, or at both base and apex, the first joint of all the tarsi yellow, the calcaria yellow, the tibiæ and tarsi fringed with silvery white hair; the abdomen very variable in its markings, with a lateral ovate yellow spot on the first three segments, two lateral spots on the fourth and fifth, and one oblong lateral spot on the sixth, or with a single spot on the first four laterally, two on the fifth, and one on the sixth, in some instances the spots are nearly obsolete, or varying in size and number; the sixth segment has a lateral curved spine, the seventh is tridentate, the central tooth or spine is short and slender, the lateral ones stout and incurved.

This insect is abundant about London; it is very partial to the flowers of the dead nettle. I used to find the nests of this bee in some old willow-trees in the Battersea fields; the holes chosen were the tunnels formed by the *Cossus ligniperda*. The cells of this bee are externally covered with a white downy substance, which the bee scrapes off woolly-leaved plants, as detailed by Mr. Kirby; I have frequently captured the female conveying a bundle of the substance to her nest. I have usually found about twelve or fourteen cells in a nest; within the external loose covering of this woolly substance, is one more compact, and within this she stores up the food for her young, which, when full-fed, spin an oval cocoon of a tough consistency, and of a dark brown colour; when the bee arrives at the perfect state, which it does not until the spring of the following year, and is ready to escape, it cuts round the top of the cocoon until it can push it up in the manner of a lid, and so makes its escape; this

is precisely in accordance with the proceedings of *Osmia bicornis*. There is a remarkable peculiarity in the relative sizes of the sexes of this insect, the males are considerably larger than the females, in some instances twice the size; this peculiarity does not occur in any other species of British bee. Time of appearance June and July.

FREDERICK SMITH.

List of Insects inhabiting Oak-apples.

THE well-known oak-apples are inhabited by a great variety of insects, which constitute a little world, and derive their nourishment either immediately or indirectly from those galls. The insects in the following list have emerged from a considerable number of oak-apples collected in the neighbourhood of Southgate during the summer of 1845.

June, 1845.

- Nitidula grisea*, 1
Balaninus glandium? 149 during this and the following months of summer
Forficula auricularia, a few in the summer, some of them were larvæ
Psocus subocellatus? a few in the summer and autumn
Atropos ———? abundant till the winter
Teras Quercus-terminalis, 495
Synergus socialis, 27. A few specimens of two or three other species of *Cynipites* appeared in the summer
Pteromalus Naubolus, 7 females
Pteromalus ———? 2 males. Nearly allied to the preceding species
Pteromalus semifascia, 1 female
Pteromalus ovatus, 5 males
Pteromalus domesticus, 6 or 7 females during the summer
Eupelmus urozonus, 4 females
Eulophus gallarum, *Nees*, 1 (*E. Euedoreschus*, *Walker, Mon. Chal. i.*)
Cecidomyia ———? 1
Cecidomyia ———? 2
Tortrix viridana, 2 or 3*

July.

- Physoevria* ———? 2 or 3
Nitidula grisea, 1
Latridius lardarius, 1
Corticaria transversalis, 2
Carpalimus fuliginosus, 1
Aleochara ———? 2
Orchestes Quercûs, 4
Pimpla ———? 1
Pimpla ———? 1
Hemiteles areator, 1

* A large caterpillar, probably of a *Noctua*, sometimes consumes the whole interior of the oak-apples.

- Teras Quercus-terminalis*, 29, 110
Synergus socialis, 516
Decatoma immaculata, 8 females
Megastigmus dorsalis, 109 males and 12 females
Callimome cingulatus, *viridissimus*, *parellinus*, *inconstans*, *confinis*, *minutus*, *exilis*, *chlorinus*, *mutabilis*, *latus*, *leucopterus*, *abdominalis*, *leptocerus*, *autumnalis*, 496 males and 443 females
Pteromalus Naubolus, 218 males and 164 females
Pteromalus dilectus, 4 males and 4 females
Pteromalus fuscipennis, 8 males and 2 females
Pteromalus fasciiventris, 1 female
Pteromalus ———? 4 males. Nearly allied to *P. Naubolus*
Pteromalus ovatus, 35 females
Pteromalus hilaris, 2 females
Eupelmus urozonus, 2 females
Tetrastichus Diaphantes, 1 male and 45 females
Eulophus gallarum, 174
Eulophus Agathyllus, n. s. 1 female
Inostemma Boscii, 1
Ceraphron ———? 1
Drosophila ———? about 20. It is nearly allied to *D. cellaris*
Lozotania Xylostearia, 1
Zeiraphera communana, 3
Chætochilus sylvellus, 1
Pentatoma lurida, 1 larva
Anthocoris Nemorum, 20 and upwards in all stages of growth, during this month and August
A few Arachnida and Acari, of such species as dwell under the bark of trees, appeared in this month and in August.

August.

- Dromius 4-maculatus*, 1
Cryptophagus cellaris, 1
Corticaria transversalis, 10
Microgaster ———? 1
Aphidius ———? 1
Teras Quercus-terminalis, 66
Synergus socialis, 15
Decatoma immaculata, 3 males and 2 females
Megastigmus dorsalis, 633 males and 578 females
Callimome, 264 males and 595 females. Species the same as in July
Eupelmus urozonus, 3 males and 1 female
Tetrastichus Diaphantes, 11 males
Chætochilus sylvellus, 1
Aphis ———?
Thrips undescribed, 25 and upwards
Pteromalus Naubolus, 403 males and 599 females
Pteromalus dilectus, 15 males and 29 females
Pteromalus fuscipennis, 12 females

Pteromalus platynotus, 5 females
Pteromalus planus, 1 female
Pteromalus dubius, 1 female
Pteromalus fasciventris, 1 male
Pteromalus decedens, 1 female
Pteromalus ovatus, 5 females

September.

Cryptophagus cellaris, 1
Latridius transversus, 3
Corticaria transversalis, 14 and upwards
Megastigmus dorsalis, 12 males and 9 females
Callimome, 4 males and 17 females. Species the same as in July.
Pteromalus Naubolus, 24 males and 23 females
Pteromalus dilectus, 1 male and 2 females
Pteromalus ———? 2 females. Nearly allied to *P. Naubolus*
Pteromalus ———? 4 males. Ditto.
Pteromalus decedens, 1 female.
Pteromalus ovatus, 3 males and 15 females
Eupelmus urozonus, 2 males
Ceraphron ———? 1
Ceraphron ———? 1

October.

Megastigmus dorsalis, 4 males
Pteromalus dilectus, 1 female
Pteromalus ovatus, 1 female
Tetrastichus Diaphantes, 1 female

December.

Megastigmus dorsalis, 3 males and 3 females
Callimome nigricornis, 1 male

January, 1846.

Megastigmus dorsalis, 8 males and 4 females
Callimome nigricornis, 2 males

February.

Megastigmus dorsalis, 33 males and 6 females
Callimome nigricornis, 35 males
Pteromalus domesticus, 6 females
Eulophus gallarum, 600 and upwards

March.

Bracon ———? 1
Synergus socialis, 4
Callimome nigricornis, 6079 males, and 981 females
Pteromalus domesticus, 16 females
Eulophus gallarum, 4513

April.

Synergus socialis, 5
Megastigmus dorsalis, 100 or upwards
Callimome nigricornis, 10,600 and upwards

Pteromalus Naubolus, 2
Eulophus gallarum, 10

May.

Bracon ———? 6
Megastigmus dorsalis, 40
Callimome nigricornis, 30
Callimome ———? 2 or 3
Pteromalus Naubolus, 708
Pteromalus ovatus, 20

June.

Megastigmus dorsalis, 5 males and 1 female
Pteromalus Naubolus and *ovatus*, 179
Eupelmus urozonus, 3 males and 5 females
Tetrastichus Diaphantes, 128

Summary of Species and Specimens.

Coleoptera	...	...	9	species.	191	specimens and upwards
Orthoptera	...	...	1	"	5	"
Neuroptera	...	...	2	"	Some	hundreds
Hymenoptera (Cynipites)	4	or 5	species.	30,246	specimens	
Hymenoptera (Parasitic)	45		"	24,417	and upwards	
Diptera	...	...	3	"	23	"
Lepidoptera	...	...	5	"	9	"
Hemiptera	...	...	5	"	51	"
Arachnida and Acari			5 or 6	"	A few	
			<hr/>		<hr/>	
Total			.....75		55,000	and upwards.

All the Coleoptera, Orthoptera, Neuroptera, Diptera, Lepidoptera, Hemiptera, and Aptera, with the exception of *Balaninus Glandium*, and *Drosophila*, were probably accidental visitors.

Teras Quercus-terminalis is the cause of the formation of the oak-apples, in each of which a great number of its larvæ reside; sometimes sixty flies or upwards emerge from an oak-apple. It varies exceedingly in size, but usually all the individuals produced from one oak-apple are of one sex, and of the same size. Sometimes the habits of the larva are solitary, and it then lives in two other kinds of galls that are formed on oak-leaves.

Synergus socialis is one of the "Inquilini," or dwellers in hired houses, as some of the Cynipites have been termed.

Pteromalus Naubolus is, perhaps, only a variety of *P. semifascia*.—*Francis Walker*.

Notes on Oak-galls.—There is a small round gall, about the size of a pea, very abundant on oak-leaves. In February and March a species of *Neuroterus* emerges from the galls that are attached to the withered oak-leaves on the ground, and by its operations fresh galls appear on the oak-leaves in the beginning of summer, and from them a new generation of flies is soon disclosed. Last year I reared from these galls 215 flies, of which there were 57 males and 158 females. They were infested by some Chalcidites, whose time of appearance was as follows:—

June.

Callimome mutabilis, 1 male

Platymesopus tibialis, 1 male

July.

Eurytoma curta, 1 male and 1 female

E. Æthiops (Boheman), 1 female

Callimome mutabilis, 8 males and 12 females

C. inconstans, 1 female

C. Geranii, 1 female

Pteromalus domesticus, 1 female

August.

Eurytoma curta, 1 female

Callimome mutabilis, 1 female

Eupelmus urozonus, 1 female

There is another kind of gall, of an irregular shape, formed on oak-leaves. The gall-fly that inhabits it is one of the "Inquilini," and dwells in a cocoon during the pupa state, and is infested by *Callimome mutabilis* and *Platymesopus tibialis*.—*Francis Walker*.

Description of Eulophus Agathyllus.—Body rather slender, convex, shining, very finely squameous, almost smooth, dark æneous: head as broad as the thorax; vertex rather broad: front impressed: antennæ black, subelavate, rather shorter than the thorax: thorax elliptical: prothorax conspicuous, transverse, narrow in front: scutum of the mesothorax rather short; sutures of the parapsides very distinct; scutellum nearly conical: metathorax short: propodeon obconic, declining, granulated: podeon short: abdomen oval, depressed above, keeled beneath, a little broader and longer than the thorax; metapodeon rather large; octoon and following segments of moderate size; paratelum and telum small: legs æneous, black; tarsi and tips of fore-tibiæ fulvous: wings limpid; nervures piceous; ulna rather shorter than the humerus; radius much shorter than the ulna; cubitus shorter than the radius; stigma small. Length of the body 1 line; expansion of the wings $1\frac{1}{2}$ line.—*Francis Walker*.

On the duration of Hymenoptera in the Larva state more than one season.—Since the instance of some individuals of the Fossores remaining in the larva state one season, at least, longer than others collected at the same time, that I observed a few years ago, as recorded in the 'Entomological Magazine,' I have not met with any instance until this season, when I have observed it among another tribe of the order, Ichneumonidæ. In the latter part of the autumn of 1844, I gathered a dead stem of a plant about eight or ten inches long, with a dense cottony mass surrounding it, about the size of a large hazel-nut, I put it in a tin pocket-vasculum which I had with me, when I got home I put it by without remembering what was in it. I had no occasion for it again until July, 1845, when I opened it and saw what I had enclosed; I began to examine the mass of cotton, I observed in the centre of it the remains of several small cocoons about a line in length, and near about a dozen larvæ which had not begun to form any cocoon. I observed them from time to time; for about a month they remained in the same state (without any of them changing into pupæ) until they died, which I believe was hastened by opening the cotton and disturbing them, as I have several times observed that the larvæ of Hymenoptera generally die after their abode has been opened, and they have been moved about afterwards.—*James Bladon*.

On destroying Bees for the purpose of obtaining their honey.—The barbarous custom of destroying bees for the purpose of obtaining their honey is very prevalent among the peasantry in this part of England; I have often lamented this unnecessary destruction of insects, so useful to man, and which, if properly managed by the poor cottager, would prove very profitable, and enable him to enjoy many comforts, which his present limited means debar him from. A sincere desire to see a better, a more humane system prevail among our poorer apiarists, has induced me to address you, in the hope that some of your correspondents will in a *plain, simple* letter state the manner in which honey may be removed from the hive without destroying its inhabitants, and also the benefits which will inevitably accrue to the party pursuing this humane system. I know that several have written upon this subject, but none have done so with sufficient simplicity and conciseness. I shall feel greatly delighted and thankful if my letter may be the means of inducing some of your numerous correspondents to prove the poor apiarist's friend, by convincing him of the error of his present system.—*G. J. R. Hughes; Whitehaven, June 24th, 1846.*

[Has my correspondent read Mr. Cotton's 'Bee Book'? The quotation therefrom in the 'Zoologist' (Zool. 24) seems an exact answer to his question.—*Edward Newman*].

Note on the habits of Macrocnema marcida.—This little insect, which is usually looked upon as one of the rarest of the British Halcidæ, I have found in profusion on most of our coasts, occurring in abundance throughout the summer on the Purple Sea-rocket (*Cakile maritima*), a plant far from uncommon on our sandy shores, where it may be frequently seen almost buried in the shingle, and other rubbish which has been drifted and accumulated around it. Wherever I have observed the plant to occur, I have never failed of finding the insect,—and often on the most minute and isolated specimens, far removed from any other species of vegetation. Near Lowestoft, on the Suffolk coast, I have taken it in profusion, where the plant on which it feeds abounds amongst the drifted sand. At Yarmouth, in Norfolk, it also occurs on the sandy flats facing the sea, though less profusely. At Tenby, in South Wales, I have captured it, but never on any plant except *Cakile maritima*, which there also abounds, growing profusely on the beach to the west of the town. On the north coast of Devon, in 1844, I might have taken *thousands* on the sand hills at Braunton Burrows, near Bideford, where the plant occurs in a few isolated instances near the new lighthouse. In the Scilly Islands it is equally abundant, where Mr. Holme relates he might have captured any number he pleased on St. Mary's. The insect, like many of the Macrocnemas, is remarkable for counterfeiting death when the plant on which it is feeding happens to be touched,—falling down to the sand (which, in colour, it resembles most accurately) and remaining perfectly motionless for a considerable length of time. I can only account for its *supposed rarity* on the hypothesis of its habitat being generally unknown; forming, as it does, a striking instance of the *exclusive* manner in which many insects attach themselves to particular plants, from which they rarely, if ever, wander.—*T. V. Wollaston, Jesus College, Cambridge, July 24th, 1846.*

Male Glowworm luminous.—I write to mention to you that during the very hot weather last month, we were visited by a firefly, apparently of the Italian kind. It flew in through an open window at night, and alarmed the servants (unaccustomed to such visits) by alighting on their bed. It was unfortunately killed, but I saw it before the light had ceased to shine, and can therefore give you any particulars you may wish for. In the 'Philosophical Transactions' for 1684 there is a paper by a Mr.

Waller, describing what he calls "an English flying glowworm," which he observed at Northem, in Herefordshire, and the light of which was so vivid as to be plainly perceived when a candle was in the room.—*Frances M. Levett ; Milford Hall, Lichfield ; Staffordshire.*

Capture of Lamia ædilis in the Black Forest, Rannock.—I am happy to state that three specimens of this rare insect have fallen to my lot, one male, and two females. This species was generally considered to have been imported into this country with foreign timber; be that as it may, I can vouch for these three specimens being British. They were much admired by several gentlemen who called to see them when alive. These insects are attracted by the scent of turpentine that oozes out of the pines in June; they are only to be found in hot sunshine.—*Richard Weaver ; Kinloch Rannock, Perthshire, July 21st, 1846.*

P.S. I forget the precise day of capture, that matters very little; they are only to be found in hot weather, whether that comes in June or July.

Capture of Trichius fasciatus, near Loch Rannock.—I have fortunately collected a sufficient number of this beautiful insect for my cabinet, and have some left for my friends; I took them flying in the sunshine, and also at rest on the blossoms of thistles and other flowers, on the following dates, June 28th, 30th, July 1st, 3rd, and 18th. These pretty insects were only to be found in one small locality, and when flying they may be easily mistaken for small specimens of *Silpha Vespillo*. I am informed this beetle is only to be seen in the old collections, not having been captured for more than twenty years. Mr. Dale informs me that he took one specimen on the thyme flower, near Loch Rannock. I am also informed that it has been taken in one confined spot in Wales, not recently, and I have not heard of its being captured in England or Ireland at any time.—*Richard Weaver ; Kinloch Rannock, Perthshire, July 21st, 1846.*

Locusts.—Captain Hager, of the brig *Marcella*, brought home a preserved grasshopper of the size of a man's thumb, as a sample of an immense field through which he sailed for five days. He fell in with the field off the Western Islands, and the presumption was, that they were blown off from Africa. The water was heavily crusted with them; the grasshoppers filling the surface to the depth of some inches, and extending in the course of the bark for 400 miles.—*Hong Kong Register.*

American Blight.—Naturalists are probably well acquainted with the difference of opinion as to the native country of this destructive creature, and with its spreading itself of late years through France and Belgium. It cannot molest the smooth and sound bark of an apple-tree, but it effects a settlement wherever there is a furrow or a crevice. It often infests the little twigs and shoots, as well as the trunk and large branches, and then there are no means of getting rid of it by any preparation applied to the tree. Like the *Psylla* and the *Aphis* (that attack the buds, and will this year cause a great failure in the apple-crops) it abounds chiefly on decaying trees; and the most effectual cure is to cut away the whole or a great part of these receptacles for the propagation of mischief, and to replace them frequently by young trees, and thus to sacrifice a present profit for greater future advantages. I am informed by Mr. Crowe, the Consul General for Norway, that this blight has lately appeared in his orchard at Christiania. Aphides, unlike most insects, seem to have two final states, the wingless and the winged; these are distinct in all stages of growth, and the former never passes into the latter, which is a pupa, or has the rudiments of wings from its birth.—*Francis Walker.*

Note on the Aphis of the Hop or Hop-fly.—At the end of last June I observed that the leaves of the hops in the neighbourhood of Birch wood were much infested by Aphides. One generation seemed to have lately passed away, and its successors were larvæ of two sizes, the smaller being apparently the offspring of the larger. The winged insect was comparatively scarce, and I did not see any pupæ. The little larvæ are spindle-shaped, greenish white, half transparent, rather flat: their antennæ white, shorter than the body; their eyes black: their mouth white; their tubes white, about one-fifth of the length of the body: their legs white, and moderately long. When full-grown they are a little broader, and of a grass-green colour; the tarsi, and the tips of the antennæ, of the mouth, of the tubes, and of the tibiæ are black: sometimes the antennæ are black; the base white: sometimes the body is pale green, with interrupted bands of darker green. When winged it is green: the disk of the head and the disk of the mesothorax above and below are black: there are a few short black bands across the disk of the abdomen, and a row of large dark spots on each side: the antennæ are black, a little longer than the body: the mouth is pale green; its tips black: the tubes are dull green; their tips black: the legs are pale yellow, moderately long; the tarsi and the tips of the thighs and of the tibiæ are black: the wings are limpid, much longer than the body; the squamulæ are pale yellow; the stigma is pale brown; the nerves are brown. It is a small species. Many of the Aphides seemed about to perish from famine in consequence of the withering of the leaves whereon they were fixed, but the Coccinellæ and Syrphi were numerous, and by devouring the Aphides, adjusted in some degree their number to the quantity of their food. Aphides are most abundant in hot seasons when vegetation is most vigorous, for then the food of plants is provided in the greatest quantity, if moisture is not wanting. In agriculture, it is said that as soon as we know what are the substances required by crops, we shall at once know how to restore to the soil those substances which each crop removes, and thus be enabled to obtain crops of the same plant for any number of years in succession from the same soil. But a rotation of crops will have the effect of diminishing the number of Aphides. The ravages of these creatures are restrained by one species being generally unable to thrive on more than a few nearly allied kinds of plants, though it often occurs elsewhere.

“ But brief the bloom, and vain the toil;

It is not native to the soil.”

Sometimes the young ones are born on a plant that yields them no nourishment.

“ Spem regis, ah ! silice in nudâ connixa reliquit.”

By varying a crop every year, the young ones, when they appear in the spring, being without the means of nourishment will soon die, and the plant will be comparatively free from their ravages. For this purpose we must first ascertain what are the elements and substances of each plant on which Aphides feed, and what variation of this composition renders the plant unfit for the digestion of the insect. The ground for the hop plantation should be changed every year, the new site being as far removed as possible from the old, and perhaps it will be found advantageous to have new poles every year for the support of the hops, and the old poles may be burned in the winter. Having announced my attention of publishing descriptions of the British Aphides with reference to the injuries which they cause to agriculturists and gardeners, I take this opportunity of requesting any information thereupon.—*Francis Walker.*

Hybrids between the Lion and Tigress.—I have just received a letter from Norwich, where one of my menageries is now open, stating, that one of the tigresses yesterday brought forth a litter of four cubs, whose sire is a descendant of the old lion Wallace. This is the second instance of such an extraordinary cross-breed ever taking place, although I have had lions and tigers living together in harmony many years; indeed it is twenty years since such a birth has occurred, and by most naturalists it has been deemed an impossibility, and certainly is as rare as it is curious.—George Wombwell; 39, North Street, Pentonville, Jan. 9th, 1746. [From the Times newspaper].

Weasels hunting in packs.—The following remarkable anecdote was communicated to me by Mr. W. Withington, Curator to the Fairfield Mechanics' Institute. A gamekeeper in the employ of Mr. Hume, of Medlock Vale, whilst taking an early stroll in the woods that border on the river, saw a hare pass near him, apparently much fatigued with long running. He stood on the watch, expecting to find some poacher's dog in pursuit, and soon heard a faint cry or yelping which could not proceed from dogs. A large pack of weasels then came in view, in full cry after the hare, which they must soon have overtaken, as it was already exhausted. The chase was, however, stopped by the gamekeeper discharging both barrels into the midst of the weasels, when according to his own, probably heightened account, seventeen remained dead, and the rest dispersed. I might add, that weasels are exceedingly plentiful along the Medlock.—J. W. Slater; *Fairfield*.

On some Whales stranded on the Belgian Coast.

By M. JULIAN DEBY.

DELPHINORHYNCHUS MICROPTERUS, *Cuv.*

Believing that every fact connected with the knowledge of the Cetacea, however trifling it may be, or appear to be, is worth recording, and having paid some attention to this branch of Natural History, I have thought a few papers on those species which I have personally observed might be agreeable to naturalists in general, and have collected accordingly all the information I could about them for insertion in the 'Zoologist,' beginning with the one commonly known as the "Toothless Whale of Havre."*

History. Only three instances, are, I believe, recorded of the appearance of this very rare species; one was stranded on the 9th of September, 1825, at Havre, in France, the second on the 21st of August, 1835, near the port of Ostend, on the Belgian coast, and the last on the 23rd of September, 1841, on the shores of the Island of Scilly. All descriptions of it before 1836 were

* I must again beg the greatest indulgence of my readers in favour of my English.

taken from the French specimen, which was first examined by De Blainville,* and afterwards noted by Cuvier† in his ‘Histoire Naturelle des Mammifères.’ Several years after this, Frederick Cuvier‡ published a good description, accompanied with figures of the animal and skull. Until 1838, all authors who mentioned this whale, simply copied what had been said before them, but in 1839 M. Dumortier read to the Royal Institute of Brussels§ an interesting memoir on the one stranded on our coast; this paper was accompanied with plates.

In October, 1841, Professor Cocco, of Messina, published|| a description of a female dolphin, fifteen feet long, and weighing 25,000 pounds, which was procured by him on the coast of Scilly. A letter of his on this animal, addressed to Professor R. A. Philippi, is published in German¶ in Wiegmann’s ‘Archiv für Naturgeschichte,’ in which he proposes to name this animal after the first-mentioned gentleman, “*Delphinus Philippi*.” Professor A. Wagner** justly remarks that he does not perceive any particular difference between this specimen and the *Del. micropterus* of Cuvier, which, according to his views, is identical with *D. Desmarestii*, found and described by Risso,†† from an individual stranded in the Mediterranean.‡‡

Professor Cocco says his animal differs from *Delphinus* (*Hyperoodon*) *edentulus* of Schrebers, from *D. bidentatus* of Sowerby, &c., but does not inform us how to distinguish it from *D. micropterus*, which he does not mention.

I do not well understand on what grounds Mr. Gray§§ sinks the *Physeter bidens*, *Delphinus Sowerbyi*, and *D. micropterus* into one species, when their osteology has been proved different by M.

* *Delphin. Dalei*, Blainv. Nouv. Bull. Sc. iv. 139, and Bull. Soc. Philom. 1825.

† *Del. Dalei*, Cuv. Hist. Nat. Mammif. liv. 53. *Del. micropterus*, Cuv. Règ. Anim. t. 288. *Heterodon Dalei* Less. Man. 419. Hist. de Cetac.

‡ *Delphinorhynchus micropterus*, F. Cuv. Hist. Nat. Cetac. 75 et 114, pl. 7, 8, fig. 1.

§ *Delphinorhynchus micropterus*. Dum. Mem. Ac. Roy. Brux. vol. xii. 1839.

|| *Delphin. Philippi*. Cocco Maurol. Journ. Messin. i. N. 4.

¶ Arch. Nat. Wiegmann. vol. xii. 104.

** Idem.

†† Hist. Nat. Nice, t. 3. pl. 2. f. 3.

‡‡ I believe this, however, to be erroneous, as the *D. Desmarestii*, Riss. which measured the *same length* as *D. Philippi*, had two large *conical teeth*, which are missing (even to the alveolæ) in the lower jaw in the last-named. Besides which, the *Desmarestii* is said to have the *tail festooned*, and *white maculations* on the back, of which not the slightest trace is discoverable in our specimen.

§§ Ann. and Mag. of Nat. Hist. 1846, p. 83.

Wesmaël,* the first belonging to *Hyperoodon rostratum* of Chemnitz.

The figure of *Delphinorhynchus micropterus*, given by Cuvier, and copied in the 'Naturalist's Library,'† is bad; the body being represented much too lengthened and fusiform; the beak too much produced; the pectoral fins too long; the neck too much marked; the dorsal fin too short; and the tail with a central protuberance, which does not exist in reality.‡

The following description is taken partly from M. Dumortier's Memoir, and partly from a figure taken from the living animal, § but all that relates to the osteology is my own. This animal which was a female, was left on the sands by the retiring tide, and purchased by M. Paret of Slykens, near Ostend; it was kept alive out of water for two days, and during this period it uttered incessant loud and hoarse bellowings, refusing every kind of nourishment.

Description. Upper parts brownish lead colour, under parts ashy white; body fusiform, attenuated at both extremities; its greatest thickness behind the pectoral fins and half way between these and the dorsal fin; head higher than broad, separated from the body by indications of a neck; forehead tumid; head gradually narrowing anteriorly, so as to end in a sub-depressed beak with a rounded extremity; upper mandible shorter and narrower than the inferior one; spiracle placed on the top of the head in front of the orbits, it is transverse and slightly arched or crescent-shaped; mouth large, presenting exteriorly no appearance of teeth; tongue attached to the inferior jaw, its edge dentate, the membrane lining the upper jaw presents similar indentations; eyes large, black, with blue iris,|| imbedded in a cushion of sub-gelatinous substance, furnished with lids, their situation is the middle of the lateral portion of the head; opening of auditory canal seen on each side of the posterior part of the head in the shape of an almost imperceptible orifice; pectoral fins placed towards the inferior part of the thorax, their insertion is included in the ante-

* Mem. Acad. Roy. Brun. vol. xiii.

† *Aodon Dalei* Robt. Hamilton, Nat. Lib. vol. Cetacea, 198, pl. 14. This name of *Aodon* is certainly to be rejected, as the Havre specimen was furnished with small sub-rudimentary teeth in the alveolæ of the lower jaw.

‡ Mr. Hamilton seems not to have known that a specimen, stranded on the Belgian coast, had been described previously to the publication of his work.

§ By Mr. Vanaeyck under the name of *Dauphin Boutskopf*.

|| Prof. Cocco says his specimen had a red iris.

rior fourth of the total length of the body, which (total length) equals a dozen times the length of these fins. Their form is oval, lengthened, obtuse at apex, and small relatively to the dimensions of the animal; dorsal fin recurved, and situated about a third before the tail, its height is less than the length of its base, it equals about one-seventeenth of the length of the body, and five times its length, reaching to the extremity of the tail;* tail two-lobed and crescent-shaped, the lobes half as long again as the height of the dorsal: the distance from the extremity of the mouth to the base of the pectorals is nearly equal to the distance from the base of the dorsal to the deepest part of the concave emargination of the tail's crescent.

DIMENSIONS.

	ft.	in.
Total length	10	7
Circumference of body behind pectorals	6	2
Length of snout or beak	0	11
Distance of spiracle from apex of beak	1	4
Width of spiracle	0	3½
Pectorals to apex of snout	2	9
Eye to apex of snout	1	5½
Dorsal to extremity of caudal	3	6
Anterior part of dorsal to apex of snout	6	3½
Length of dorsal	0	9
Length of pectorals	0	10½
Width of pectorals	0	4½
Width of caudal from angle to angle of crescent	2	2
Anus to apex of tail	3	1
Vulva to apex of snout	6	9
Length of vulva	0	5½
Vulva to anus	0	5
Height of dorsal	0	4½

Anatomy. Little is known of the viscera and internal parts of this whale, the only portions which have been preserved being 1, the digestive organs, 2, urinary apparatus, and 3, windpipe.

1. The first of these, as is the case with all Cetacea, is formed of three cavities, corresponding to those of ruminating animals; the

* All these measures are simply made by sight, and are not rigorously exact for their dimensions.

first of these (the largest) is pear-shaped, and lined internally with a mucous membrane furnished with numerous villi; the second (the smallest) communicates directly with the third, which is distinctly divided by numerous transverse folds into nine or ten small cavities. Continuing this third cavity, we find an intestinal canal which does not vary in size, and presents neither cœcum, colon, nor apparent rectum.

2. Bladder oblong, lengthened, proceeding from two ureters, which towards their extremity make a bend on themselves, communicating with a large gland, after which they direct themselves forwards; the canal of the urethra is placed inferiorly.

3. The length of the windpipe unto its branching is 1 ft. $2\frac{1}{2}$ in.; from the orifice of larynx to the pharynx 5 in.; length of the branches after bifurcation about $11\frac{1}{2}$ in.; each branch throws out about a dozen ramifications. The termination of the pharynx is duck-bill shaped.

Osteology. The *head* of this species is well described by F. Cuvier, and still better figured; there exist, however, some slight discrepancies between his specimen and mine.

The *superior maxillary bones* are very narrow, and united at their extremity to the intermaxillaries, which anteriorly protrude beyond and above them. In the inferior carena of the maxillaries, the vomer presents itself rather wide at first, but diminishes gradually in size posteriorly.

The *intermaxillaries* follow up the frontal bones to the top of the skull, where they curve forwards, forming small granular horns.

Between these two horns are placed the *nasal bones*, resembling in shape small approximating tubercles. The plate of the *ethmoidal bone* between the nasal fossæ is very thin and sharp. *Spiracle* regular. *Frontal bones* nearly covered by the base of the superior maxillaries, so as only to show externally a narrow edge, which is seen extended from the temporal crests to the lachrymal bone. *Frontal bone* arched above the eye, and resting by means of a postorbital apophysis on a corresponding zygomatic process of the *temporal bone*, which is small. *Malar bones* short, slender, and awl-shaped, they articulate with the suddenly dilated portion of the maxillaries. *Mastoid bones* not large. *Occipital bone* depressed superiorly and in the middle, convex towards the temporal fossæ, and again flattened along the temporal bone; along this last depression on the posterior part of the skull, the occipital bone forms a double ridge, leaving a narrow medial ca-

nal. *Sphenoid* transverse. *Pterygoidal bones* arched. Inferior maxilla arched inferiorly, wider at apex than in the middle and much dilated in the region of the cheeks. *Lachrymal bone* small; behind it may be seen a small aperture, which seems to communicate with the cavity of the mouth. *Pterygoidal wings* large and multisinuate, and *palatinal bones* small. *Inferior maxilla* without teeth, but presenting in the middle a small, but deep alveole, which would perhaps have contained at a later period a few small teeth.

Vertebræ. The vertebral column is formed of

- 7 Cervical vertebræ.
- 10 Dorsal.
- 11 Lumbar.
- 1 Sacral.
- 13 Caudal.

Total 42 vertebræ.*

Atlas and *axis* joined together, so as to form in appearance one vertebra with two united spinal processes, and two lateral ones on each side; above the posterior lateral process, two orifices which communicate with the spinal cord may be seen, and a notch exists on the anterior side of the upper part of the spinal processes. *Third* and *fourth* cervical vertebræ with nearly united spinal processes and very small lateral ones. These are directed forwards in the fourth and backwards in the third. *Fifth*, with spinal processes nearly united into a V. *Sixth*, with spinal processes united superiorly. *Fifth* and *sixth*, with lateral processes having their apex widened and directed forwards. Several with spinal processes V-shaped, and prolonged in the shape of a beak about $2\frac{1}{2}$ in. long; lateral process rudimentary. All the cervical vertebræ have at the base of their spinal processes an angular, lateral projection. *First costal vertebra* the smallest of the ten, and the narrowest, the tenth the largest and widest; all the costal vertebræ have the summit of their spinal processes truncate and somewhat rounded at apex. Lateral processes of the base of the spinal ones rugose, and directed obliquely forwards in the seven first, and straight forwards in the three last. The costal vertebræ are notched anteriorly, and posteriorly at the base of the spinal processes. The ribs are more or less depressed and compressed,

* And not 38, as erroneously indicated by M. Dumortier, Mem. p. 11.

especially towards their extremities. The seven first two-headed ribs are joined to the sternum, which is sub-cartilaginous, and the three others or false ribs have the apex free. The sternum, which is not yet ossified in all its parts, is formed of seven distinct bones, the superior one of which is the largest, it is truncate superiorly, and forked posteriorly; the following sternal bones go on gradually decreasing in size, and have a square shape with a rounded notch on their anterior and posterior margins. On the inferior surface of the first sternal bone are two rounded depressions.

The eight first costal vertebræ have no lateral processes, but the two last are furnished with them.

The eleven *lumbar* vertebræ have the same shape as the two last costal ones, their lateral processes are wide, long, and directed forwards.

The *sacral* vertebræ and six first *caudal* vertebræ have both superior or spinal and inferior processes, the seventh and eighth caudal, only spinal ones, and the remainder have no processes of any kind, and are more or less globular. These last go on diminishing gradually in size until the terminal one, which is smaller than a pigeon's egg. The inferior process of the sacral vertebræ is angularly elbowed. The seventh caudal has a small rudimentary inferior process placed on the inferior posterior margin of the vertebræ.

Limbs, &c. Metacarpus wanting or cartilaginous. Scapular rather small, its coracoid process is double the size of the acromion, and slightly curved: humerus shorter than radius: radius and cubitus tubercular, and very approximating: bones of carpus placed in two rows, there are six of them, of which the two medial are the largest: upper finger formed of two phalanges, second of four, third of four, fourth of five, and fifth of one phalanx.

Hyoid apparatus formed of five bones, of which the middle one is pentagonal, and the others depressed and lengthened, two of them being double the size of the others. Two small ischionian bones existed suspended in the flesh, but they had been lost.

DIMENSIONS OF SKELETON.

	ft.	in.	line.
Total length of head	2	0	0
Apex of inferior maxilla to auditory canal	0	18	0
Crest to the atlas	0	5	5

	in.	line.
Advance of inferior maxilla	0	6
Length of cervical vertebræ taken in a straight line from apex of spinal processes to base of transverse ones:—		
First (atlas and axis united)	3	4
Second	2	7
Third	2	7
Fourth	3	0
Fifth	3	6
Sixth	4	1

	Height.		Width of apex of spinal process.	
	in.	line.	in.	line.
First dorsal vertebra	5	7	0	5½
Second	6	6	1	0
Third	7	0	1	3
Fourth	7	3	1	7
Fifth	7	6	1	5
Sixth	7	6	1	6
Seventh	7	1	2	0
Eighth	7	6	2	4
Ninth	7	7	2	4
Tenth	7	7	2	4

Length of ribs, measured in a straight line from basal angle to apex.

	in.	line.
First rib	8	0
Second	11	5
Third	13	2
Fourth	14	6
Fifth	16	0
Sixth	18	4
Seventh	18	1
Eighth	14	7
Ninth	13	5
Tenth	6	9
Greatest width of scapular	8	0
Greatest height of ditto	5	2
Coracoid process	2	6

		in.	line.
Greatest height of largest bone of sternum	.....	5	6
Greatest breadth of ditto	.....	4	4

JULIAN DEBY.

(To be continued).

Partial Migration: being remarks upon the subject, as applying to the parish of Melbourne, Derbyshire. By J. J. BRIGGS, Esq.

MANY years before Mr. Newman's interesting article and Mr. Jerdon's notes, drew my attention more particularly to the subject of "Partial Migration," I conjectured that such was the case with many birds, and made remarks accordingly. Scotland, ever foremost in song and science, in art and agriculture, has not allowed her natural historians to remain silent upon this subject, and consequently we find that Mr. Hepburn, Mr. Jerdon, and others are pursuing it with that zeal and ardour so characteristic of her sons, and I heartily wish them success in their pleasant labour. Of their invitation to join them in the work I gladly avail myself, and echo the wish of Mr. Hepburn, that each naturalist who contributes to the 'Zoologist' "may give the most careful attention to the habits and distribution of the birds which occur in his daily walks," and I would add, also communicate the result, to this, the true 'field-naturalist's journal.' I am fully aware that the accompanying list is very imperfect, but I hope at some future opportunity to compile a complete 'Fauna Melbourniensis' for the 'Zoologist,' for which I have long been collecting materials.

Kestrel, *Falco tinnunculus*. This bird appears to exist in greater numbers hereabouts, in the month of February than any other, but I am inclined to think that we have no accession to them at that period, but that they come more frequently under the eye, on account of their habit of drawing closer to farms and rick-yards in search of the small birds which the severe weather brings together.

Common Dipper, *Turdus Cinclus*. Breeds by our mountain streams, and as winter approaches, comes down to the Trent and stays hereabouts till towards March.

Song Thrush, *Turdus musicus*. Flocks or parties come with the northern birds of passage, spread themselves chiefly over turnip-fields,

and depart towards March. Many, however, speed further south, for I have several notes of flocks observed on their passage.

Redwing, *Turdus iliacus*, Fieldfare, *Turdus pilaris*. If severe weather sets in some weeks after the arrival of these birds, they journey more south, and again return when it is milder.

Stonechat, *Sylvia Rubecola*. This little bird is well-known to remain the year through (but in lesser numbers in summer), upon the heaths and moorlands of the Peak. Those that leave in summer come down to the more southern parts, and reach Melbourne in the month of April, and again depart in September. One instance, and one only, has come to my knowledge, of a stonechat being killed here in the depth of winter.

Whinchat, *Sylvia rubetra*. It appears to me that all the whinchats do not leave England in winter. They arrive here in April, and depart in September; but I am informed by William Hewett, Esq., of Reading, Berks, that they are seen on the open downs about East Isley at Christmas, so that some merely shift their quarters a little more southward in our own country.

Pied Wagtail, *Motacilla Yarellii*. Some stay the year round, some depart towards October, and we receive fresh visitors again towards March.

Gray Wagtail, *Motacilla Boarula*. I had long thought this bird a summer visiter, but upon strict investigation, I have made out that he comes to us in October, and departs in March.

Ray's Wagtail, *Motacilla Rayi*. This bird arrives here early in April, and departs early in September. Besides those that nestle with us large numbers are occasionally observed in the spring, as though on their route southwards. I once put up more than forty from the grass in one field, in parties of seven or eight at a time. I had long thought that all individuals of this species *left our shores in winter* for more southern climes, and I feel little doubt that the same opinion was held by most others of my fellow labourers, but I have now good reason to believe that some remain in the *warmer* parts of this country the year round. William Hewett, Esq., informs me "that the yellow wagtail is found near the Downs, East Isley, Berks, in winter, sporting amongst the sheepfolds." Mr. Mason, also of Reading, "shot a beautiful bird of this species close to the town, in December, 1845, which he had preserved."

Meadow Pipit, *Anthus pratensis*. In average winters is an annual resident, but if severe weather occurs they frequently leave us

almost to a bird; flocks also from more northern localities pass southwards.

Skylark, *Alauda arvensis*. The remarks upon the pipit will also apply to the skylark. In particular seasons, however, when large masses of snow have accumulated northwards, we have numerous flocks of larks from that quarter which continue with us some time, and seem so famished with hunger that they come into our gardens to feed on cabbages and greens.

The Common Bunting, *Emberiza miliaria*. The greater part of our buntings leave us as soon as the corn harvest is finished, but return in February or March.

Black-headed Bunting, *Emberiza schoeniclus*. Most leave after the breeding, and return as spring advances.

Goldfinch, *Fringilla carduelis*. After the breeding season most of our goldfinches leave us, and return towards April. I believe that those in spring outnumber those in winter by at least ten to one.

Siskin, *Fringilla spinus*. Visits us in small flocks at uncertain intervals.

Stockdove, *Columba Œnas*. Is resident the year round in certain numbers, but a remarkable circumstance attends this bird's history. In the autumn stockdoves visit Donnington Park by thousands, feed on the acorns, and after staying a few weeks, until the best of them are gone, take their departure. This takes place annually.

Golden Plover, *Charadrius plumialis*. Visit us in severe winters in flocks, but at uncertain intervals.

Common Snipe, *Scolopax gallinago*. Comes down from its northern breeding grounds to our neighbourhood about Michaelmas. Many remain the summer through, but have never been known to breed.

Wild Duck, *Anas boschas*. Some remain here the whole year, but these are augmented in numbers by others which come in winter from other quarters; parties keep coming and going, according to the temperature of the weather, till March.

Wigeon, *Anas Penelope*, Teal, *Anas crecca*. Never breed; parties reach us most winters in hard weather.

JOHN JOSEPH BRIGGS.

NATURALIST'S CALENDAR FOR OCTOBER.

BIRDS.—In this month the winter birds arrive in rapid succession. Redwings appear in abundance in the first week, and fieldfares soon follow, being generally here by the middle of the month. The brambling (*Fringilla montifringilla*), the siskin (*Carduelis spinus*), and the snow bunting (*Plectrophanes nivalis*) arrive. The brambling is particularly partial to beech-nuts, and may sometimes be seen in immense numbers in beech woods. Wherever alders skirt the margins of streams, the siskin is almost sure to be found feeding upon the seeds, often in company with goldfinches and redpolls. The snow buntings principally frequent the coasts, feeding upon the seeds of the plants growing upon the shore. The waders are to be seen in vast flocks, and the pigmy curlew, dunlin, sanderling, and ring dotterel are often associated together. The purple sandpiper is more often found singly, or only in small companies, and gray plovers, principally young birds of the year, are not uncommon on many parts of the coast.

INSECTS.—Although the Lepidoptera begin to decrease in numbers, yet many species may now be found. The sword grass-moth (*Calocampa exoleta*) now emerges from the chrysalis, and lives through the winter in the perfect state. The beautiful *Miselia Aprilina* also appears, and many other *Noctuæ*, as *Glæa spadicea*, *Mecoptera satellitia*, *Orthosia Lota* and the rare *Agrotis saucia*. The death's-head moth (*Acherontia Atropos*), the largest European lepidopterous insect, is now on the wing. The common and beautiful feathered thorn-moth (*Himera pennaria*) is found in every wood, and *Oporabia dilutata* may be taken in profusion. Many small moths may also be found, and some of the larger dragonflies yet remain.—*Henry Doubleday; Naturalist's Almanack for 1845.*

An Account of Raine's Islet, on the N.E. coast of New Holland.

By JOHN MACGILLIVRAY, Esq.

ON May 29th, 1844, we reached Raine's Islet in H. M. S. "Fly," and commenced landing the materials requisite for the erection of a beacon on the N.W. end of the island, as a guide to vessels making the Great Barrier Reef from seaward. Having remained upon the Island for the space of a month, in order to procure specimens of the various objects of Natural History, I give the following abstract of my observations.

From an unknown depth, a detached coral reef of an irregularly oval form rises in the centre of an opening, eight miles wide, in the line of the Great Barrier Reef, having at its windward extremity a sandy islet in lat. 11° 36' S. and long. 144° 07' E. This, in dimension, bears but a small proportion to the reef which supports it, being only about one mile in circumference, of an oblong shape, running S.E. and N.W. The structure of the island is simple, and may be thus de-

scribed. Its outer margin is formed by a moderately steep beach, of course calcareous sand mixed with larger fragments of coral and shells, extending back for twenty yards or more, with a few scattered tufts of grass and other herbage. The higher or vegetated portion of the island is surrounded by a more or less continuous, low, wall-like border of coral rock, its faces much decomposed by the weather, and hollowed out in a singular manner into innumerable intricate winding openings, some of which are large enough to admit a man's body. This rock, which varies from a conglomerate to a coarse sandstone, is in general soft and crumbles readily in the hand, but at one end of the island, blocks of sufficient size and hardness to be used for building purposes were obtained in abundance. This bed of sandstone is not more than a few feet in thickness, and exhibits proof of its recent formation, by containing shells and fragments of coral, specifically identical with living inhabitants of the reef, and occasionally eggs of turtle,* apparently as if, while *in situ* in the loose sand of what was then a mere sand-bank, some chemical agency had converted the whole into a bed of stone. The centre of the island is considerably lower than the margin, the highest part of which is about twenty-four feet above high-water mark. Various attempts were made to procure fresh water by digging, but without success. One pit, dug to a depth of sixteen feet near the centre of the island, presented the following succession of strata :—1stly, a layer, three inches thick, of rather fine coral sandstone ; 2ndly, a deposit, nine inches in thickness, of moist pulverulent black earth, resembling peat, but without any traces of woody fibres ; 3rdly, and extending to the depth of thirteen feet from the surface, are successive deposits, varying from coarse coral conglomerate and sandstone to unconcreted calcareous sand mixed with a few small scattered fragments of coral and shells ; 4thly, a layer of masses and large fragments of coral (of species now alive on the reef), bleached and water-worn, loosely imbedded in coarse sand ; and here the boring was discontinued in consequence of the ingress of salt water, which ebbed and flowed with the tides. The greater portion of the centre of the island affords a superstratum of rich black mould, well manured with the dung of sea-fowl ; and in a small garden established there, many culinary vegetables were found to thrive well.

Owing to the slight range of tide at Raine's Islet, the reef is completely uncovered only at low-water spring-tides, the rise and fall

* A specimen of this description from Ascension is exhibited in the Museum of the Geological Society.

being then about nine feet. On such occasions, when the sea is pretty smooth, one may walk to the verge of the reef in any part, and closely observe the numerous species of coral which there flourish in great beauty and vigour. The margin is very irregular, generally overhanging, intersected with small channels and deep winding recesses fringed with massive and branching corals. In many places the surface is found to be a mere shell or crust, the roof of cavernous excavations communicating outwardly with the surrounding waters, and occasionally also with the surface of the reef, by small apertures or blow-holes, through which the water boils up at each heave of the sea. Outside, the base of the reef slopes very suddenly, probably at an angle of not less than 45° ; there is consequently no anchorage for large vessels under the lee. On one occasion, H. M. Sch. Bramble, whilst holding on to the reef by a kedge and two hawsers on end, sounded in 350 fathoms, and no bottom was ever obtained at a greater distance (to seaward) off the reef, than a quarter of a mile. The body of the reef is nearly a dead level, strewed over with large, flat, loose masses of coral, generally partially immersed in shallow pools left by the tide, with occasional accumulations of fragments of corals, dead shells, sand, and other detritus. Several species of *Alcyonium* clothe the stones with their sponge-like slippery expansions of various colours, chiefly green. The Algæ on the reef are few in number, consisting chiefly of delicate confervoid species.

Of the Botany of the islet I can give but a very meagre account, for a collection of about twenty species, found by me, unfortunately went to decay for want of a proper place of stowage on board ship. Several of these species I have elsewhere observed on the main land of New Holland; among others, a long, trailing, woody plant, with conspicuous yellow blossoms, and a large white-flowered *Convolvulus*. Two species, very abundant, on the island, were used by us as vegetables, one of them under the name of spinach, for which it was considered a very fair substitute, and as such served out to the ship's company. Most of the plants of the island are more or less succulent: there is but one shrub, a slender *Acacia*, five or six feet high, with small yellow flowers.

No Mammalia were observed upon Raine's Islet, but we found not less than eighteen species of birds, several of which were new to science, inhabiting this mere speck of land, and to me they constituted the most interesting feature of the place. Upon nearing the shore on my first visit in May, 1844, an immense cloud of sea-fowl was observed hovering over the place, and their cries were distinctly heard at

the distance of a mile. Crossing the reef, we landed on a steep sandy beach, and a few yards further brought us upon one of those vast breeding-places of birds, of which none but an eye-witness can form an adequate idea. The ground was so thickly strewed with eggs, that we could not walk about without occasionally crushing them under foot; myriads of terns, noddies and boobies darkened the air around; the mingling of loud, harsh, discordant cries was absolutely deafening, and caused even a painful sensation, which, with the stench from numbers of putrifying carcasses and other sources, was almost insufferable. The birds appeared so little accustomed to the sight of man, that many, busily engaged in incubation, allowed of very close approach. Some frigate-birds sitting upon their nests awaited our coming up with perfect composure, and stoutly defended their eggs with open beak, nor would they take to wing until pushed off the nest with a stick. A large flock of gannets and boobies covered a bare spot in the centre of the island, chequered black and white with their dense masses. The eggs and newly-fledged young of the tern and noddy were turned to good account by the party established upon the island, and with an occasional turtle, now and then some fish, and abundance of fresh vegetables, they fared considerably better than on board ship. I amused myself one day with making a calculation of the consumption of young birds and eggs during the month of June, and found it to amount, at the lowest reasonable estimate, to 3,000 of the former, and 1410 dozen of the latter.

The birds found by me on Raine's Islet are of eighteen species; of these the three first may be regarded as stragglers, having occurred only once, the remainder being either permanent residents or visitants during the breeding season; eight are land-birds, three waders, and the others are sea-fowl.

<i>Calloctalia arborea</i>	<i>Thalasseus strenuus</i>
<i>Rhipidura</i>	<i>Thalassipora fuliginosa</i>
<i>Porzana</i>	<i>Anous stolidus</i>
<i>Rallus Philippensis</i> ?	<i>Phaëton phænicurus</i>
<i>Erodias</i>	<i>Atagen Ariel</i>
<i>Erodias</i>	<i>Sula personata</i>
<i>Charadrius Virginianus</i>	<i>Sula Fiber</i>
<i>Streptilas australis</i>	<i>Sula</i>
<i>Xema Jamesonii</i>	<i>Puffinus</i>

To these were afterwards added by Lieutenant Ince, *Anous leucocapillus*, *Thalassipora Panayensis*, and *Atagen Aquilus*.

Rallus Philippensis. Is very abundant all over the island, the

dense succulent herbage affording excellent shelter. It is also fond of skulking about the holes in the low margin of coral rock, from which, as well as from the burrows of the mutton-bird, I have taken it with the hand. It runs with amazing velocity, seldom taking to wing, and is very wary. This unwillingness to rise from the ground enabled us to procure great numbers for the table, by means of a kangaroo-dog, which became very expert at finding and catching them. In one day not less than forty-five were killed by the dog or taken with the hand. Several individuals, more or less variegated with white, one very largely, were met with.

Erodias, two species. Some white and blue herons frequented the reef, and probably are permanent residents, judging from some deserted nests and fragments of eggs which I saw.

Charadrius Virginianus and *Streptilas Australis*, occurred in small numbers, but were not found breeding.

Xema Jamesonii. Of this beautiful gull, which appears to inhabit all the Australian coasts, I saw only a few pairs.

Thalasseus strenuus? This fine tern, which I had formerly found breeding on Lizard Island, occurs on Raine's Islet in small parties in three spots only, upon the low ridge on the south side of the island. It is rather shy, so much so, that I could not obtain specimens without the aid of the gun. It breeds upon the bare smooth spots surrounded by herbage, and deposits a solitary egg in a slight hollow scooped out of the ground.

Thalassipora fuliginosa. Breeds, mixed up with noddies, in large colonies. After we had been living about ten days upon the island, and the sooty terns had had their nests robbed repeatedly, the breeding birds collected into two or three large flocks, and deposited their eggs in company, shifting their quarters occasionally upon finding themselves as much molested as formerly. I have seen the poor creatures dropping their eggs within two yards of where I sat, apparently glad to get rid of their burthen at all hazards.

Anous stolidus. Unlike the sooty tern, the noddy constructs a regular nest, varying in composition and locality. The nest is placed either upon the bare ground, or on a tuft of grass or other herbage, formed of small twigs, over which are scattered a handful or more of fragments of coral of all sizes up to several inches in length, also shells, and occasionally other matters, such as fragments of turtle-shell, turtle-bones, &c., in short, any miscellaneous article which comes in the way.

Phaëton phænicurus. During my stay on Raine's Islet, about a

dozen of this, the most beautiful of sea-birds, were caught with the hand in holes under the cliffy margin of the island: in two instances they were employed in incubation. There is no nest, and the solitary egg, large in proportion to the bird, is blotched and speckled with brownish red, on a pale reddish gray ground. Nearly every day, two or more tropic-birds might have been observed hovering about, taking long sweeping flights and finally pitching at the entrance of some favourite hole.

Atagen Ariel. This frigate-bird was found breeding in small colonies of about a dozen individuals. Its nest is formed of small dry twigs, raised about a foot from the ground, or sometimes placed upon a tuft of herbage, a foot in diameter, shallow, without any lining. There is but a single egg, white, smooth, and measuring 2·6 by 1·7 inches. The unfledged young is covered with white down, with black feathers on the back between the wings. On one occasion I met with two young in one nest, which unusual circumstance I have good reason to believe originated from the adoption of an orphan by a female, with nest and young one close by.

Sula personata. After we had been for a few days upon the island, the gannets, which were never very numerous, had almost entirely left during the day, returning at night to roost.

Sula ———? This is a small species of gannet, which we named provisionally the “white booby.” Its changes of plumage are remarkable and puzzling. Early in June, this species, the young having been for some time able to fly, forsook the island during the day, returning at night to roost in a large body of several hundreds.

Sula Fiber. The well-known brown booby breeds upon Raine’s Islet, but in small numbers, as I found its nest there only once.

Puffinus ———? The name of mutton-bird has been applied in Australia to the different species of this genus;—why, I do not know. On Raine’s Islet we found a small colony of these birds among some rank herbage which concealed the entrances to their burrows, in which they were easily caught. Never having seen one on wing during the day-time, and having taken both males and females from their holes, it is probable that they are, in a great measure, nocturnal. I observed the same circumstance at Heron Island, where all night long numbers of this, or a nearly allied species, continued flying about our fire, while at daybreak, not one was to be seen.

A visitor to Raine’s Islet, is apt to be surprised at the number of dead turtle scattered about the margin of the island, the remains probably of such as have fallen on their backs while endeavouring to

climb the low rocky border, and being unable to right themselves, there miserably perished. These are all of the green species, which resorts to this and the other sand-banks and islets on the N.E. coast of New Holland, in considerable numbers, to deposit its eggs. The night time is chosen for this purpose, and the female digs a large hole or pit behind the beach, in which she lays as many as fifty or more eggs, carefully covering them over with sand. These eggs are an inch and a half in diameter, orbicular, white, and invested with a thin skin, like parchment. In due time, the young are hatched, and instinctively make for the sea, not however without encountering many enemies, as they are preyed upon by various kinds of sea-fowl, from the frigate-bird down to the sooty tern, for I have taken a young turtle from the stomach of a tern which had swallowed it entire. One night I was much surprised to witness the eruption of a party of newly-hatched turtles from the sand under the blanket on which I lay; in less than half an hour about a dozen made their appearance, and it was amusing to observe how each instinctively scrambled off in the direction of the sea, from which course I found it impossible, after many trials, to make them deviate. During the months of June, July and August, the turtle occurred at irregular intervals, generally singly, but in the beginning of September they became more numerous.

Fish were found on the reef in great abundance; shoals of a large *Fistularia* and a fine *Prionurus*, with occasionally a few Mullet, were in the habit of coming in with the flood tide, and at low water any number of "eels"—a snake-like fish of the family *Muraenidæ*, might be procured. One of these last, usually about three feet in length, of a pale greenish white colour, closely studded with minute greenish brown spots arranged in small clusters, we found to be capital eating, and for this purpose killed great numbers with a bayonet fixed on the end of a stick. It frequents the small pools left by the tide, getting under stones and insinuating itself into holes and crevices when pursued, and bites fiercely at anything presented to it—as a stick, or the finger.

The Entomological field is very limited in extent, there being probably not more than thirty species of insects, but some of them are sufficiently interesting to merit especial mention. A large scarabideous beetle, found occasionally under the surface by digging, was considered by that eminent entomologist, Mr. W. S. MacLeay, to be undescribed. The quantity of dead bodies of birds and turtle affords the means of sustenance to several necrophagous Coleoptera, among others a small brilliant *Hister*, a *Necrobia*, like *N. ruficollis*, and that

cosmopolite, *Dermestes murinus*. This last, a small black beetle with silvery under surface, proved a source of continual annoyance by attacking my skins of birds, which I was obliged to examine every few hours, and clear off such as had effected a lodgment, chiefly under the wing, and this in spite of the plentiful use of arsenical soap within, and corrosive sublimate without. The same circumstance occurred to Mr. Gilbert,* while collecting on Houtman's Abrolhos, on the west coast of New Holland. A small brown beetle (*Pimelia*?) exists in surprising numbers among the roots of grass and under stones, and I seldom awoke of a morning without finding a number located in the folds of my blanket. But the most troublesome of parasites were the various kinds of "ticks," one of which, flat and crab-like, and varying in length from one-eighth to half an inch, of a genus allied to *Ixodes*, by fastening to our bodies while sleeping on the sand, caused very painful swellings, and occasionally even ulcerations. The different sea-fowl were much infested with these insects, which attacked chiefly the feet, eyelids, and angles of the mouth, and it was not uncommon to observe the web between the toes almost entirely eaten away by them.

Among the Crustacea, a nocturnal species of Ocypoda is the most interesting. It inhabits deep burrows in the sand, whence it issues at night, prowling about in search of carrion of every description on which it feeds. As its generic name indicates, it runs with great velocity, and when chased makes either for the sea or the nearest burrow. This species extends from Sandy Cape to Port Essington, inhabiting all the sandy coasts, islets, and sand-banks.

As might be expected, Raine's Islet abounds with marine productions, especially Radiata and Mollusca. Of the former, the various species of *Holothuria* or Trepang, some of which are fished for by the Bugis on the north coast of New Holland, are most apt to arrest the attention. They have the appearance of large loathsome slugs, gray or black, smooth or tuberculated, possessing the power of contraction and extension to a remarkable degree, being capable of shortening themselves from a length of a foot and a half to one of five or six inches only. The intestines of several which I opened were distended with coral sand. Some fine shells were found on the reef, chiefly un-

* Speared by the natives near the head of the Gulph of Carpentaria while accompanying Dr. Leichardt's overland party from Moreton Bay to Port Essington. The writer of this saw much of him a few months before his departure on his last and fatal journey, and cannot help paying a parting tribute to the perfect integrity and indomitable energy of his late friend. Mr. Gilbert's numerous discoveries are to be found recorded in Mr. Gould's splendid work on Australian Zoology.

der the loose blocks of coral. These belong to about thirty genera, a bare enumeration of which would scarcely excite much interest. A species of *Hippopus*, the largest known shell, the *Chama gigas* of old writers, is particularly abundant, so much so, as to have furnished all the lime used in the building of the beacon. While alive and on the reef, the clam-shell is apt to form a very effective man-trap, by closing itself upon any one who wades about incautiously in the shoal water. The animal is gaudily coloured either with green or blue, there being two distinct varieties, if not species. In closing its shell, a small spout of water is sent up through a tubular orifice.

JOHN MCGILLIVRAY.

Ornithological Excursion to the North coast of New Holland.

By JOHN MCGILLIVRAY, Esq.

As a brief account of the manner of life, occasionally adopted by travelling naturalists may interest some of your readers, I send you a rough sketch of an ornithological excursion on the North coast of new Holland.

In October 1844, my friend Lieut. Ince, R. N., and myself, accompanied by some natives and others, left the settlement of Victoria, and were duly landed at Moormal, twelve miles further down the harbour of Port Essington. Here we formed our camp, having a sheltered bay for the boat, a well of tolerable water 300 yards distant, and several lagoons, said to abound in aquatic birds, within reach of a morning walk. As usual, the first to welcome us on shore were our old friends the mosquitos, and in due time our hands and faces bore the marks of elaborate chasings, the work of these blood-thirsty pests of tropical Australia. A small circular lagoon a quarter of a mile distant was the first visited by us, but, it being now near the end of the dry season, the water had disappeared, and the dried up mud was covered with dead shells of four species of as many genera—*Pirena*, *Planorbis*, *Succinea* and another:—here it was that poor Gilbert discovered the beautiful *Nettapus pulchellus*. After ineffectually chasing some “native companions” (*Grus Antigone*), and getting an occasional shot at a Torres Strait pigeon (*Carpophaga luctuosa*), or a quail (*Synoicus Australis* and *Turnix castanotus*), while striking across some forest land, we reached a very large lagoon of brackish water, which on former occasions had been found well stocked with wild-

fowl. To our great disappointment, however, we saw that a party of natives were encamped on its borders, and had effectually scared away most of the birds. The low state of the water had made it favourable for capturing the fish (of four species), which then existed in considerable numbers, and the natives had flocked to the place from all quarters; hundreds of hawks, chiefly *Milvus affinis*, were assembled about the encampment, and their daring in carrying off fragments of fish and offal from within a few feet of the fires, surprised me not a little. The effluvia given off from the mud and stagnant water, with the thermometer at 94° in the shade, and not a breath of air stirring, were so sickening, that at length we were glad to leave the place—well characterized by the natives in their name for it, “the stinking ground.” Flights of a large Vampire bat (*Pteropus funereus*) made their appearance at sunset, flying about the tall *Melaleuca* trees, on the flowers of which at this season they chiefly feed; while during the day they remain suspended from the branches among the dense mangrove thickets. I have some eggs of that singular bird the *Megapodius Tumulus*, dug out from a mound in the neighbourhood, which were brought us by the natives.

Finding that little was to be done at Moormal, we shifted our quarters two miles further South, and constructed a rude tent from the boat's sails among some low bushes behind the beach, close to a well of excellent water; this last in Australia is always a consideration of the first importance. The great attraction, however, to us, was a neighbouring small lagoon (*Amurake* of aborigines) of nearly fresh water, a favourite haunt of aquatic birds and waders. This is about three quarters of a mile in length, and at this season seldom exceeded four feet in depth, and was partially overgrown with a species of *Eleocharis*. In the numerous pools a handsome *Nymphæa*, with large, ‘pale blue, odoriferous flowers, nearly concealed the surface of the water. The water is so slightly brackish, that two species of freshwater shells are abundant about the margin, which is separated from the neighbouring forest by a belt of *Melaleucæ* or “Tea trees,” the singular bark of which is much used by the aborigines for constructing temporary huts.

While we remained in this neighbourhood the usual daily routine was seldom varied. Earliest dawn generally found us on our way to the lagoon, on reaching which we proceeded to search the opposite sides. Our first attention was devoted to the procuring of a few geese (*Anseranas melanoleuca*) and black ducks (*Anas superciliosa*) for food, which being accomplished, these birds had a respite for the

remainder of the day. Now commenced the hardest but most pleasant portion of our daily labour, the wading about for three or four hours, immersed in water up to the middle, (with one's ammunition in his cap as the only dry place about him), at one time dashing through the water in hot pursuit of a wounded egret, at another silently concealed behind a dead tree growing in the water, watching with palpitating heart until a pair of pigmy geese shall afford a chance of making a successful shot. That curious and very rare little bird *Parra gallinacea* inhabits the centre of the lagoon, but is so exceedingly shy, that I have occasionally chased it for hours together without success, from its habit of rising out of gunshot; aided by its enormously long toes, it shuffles along among and over the tops of the rushes with great celerity. Three tiny water-rails, of the genus *Porzana*, were collected here by me—one is abundant, but of the others solitary specimens only occurred. Occasionally we came upon a flock of glossy Ibises (*Falcinellus igneus*), or of white-headed stilts (*Himantopus leucocephalus*), or a solitary snow white-heron (*Erodias*), as, ever on the watch, his quick ear detects the advance of the prowler, and up he springs from the reeds, leaving uncaught the frog which he had been waiting for, with more than an angler's patience. But to my mind the most beautiful inhabitant of the lagoon is the flying goose (*Nettapus pulchellus*), and as if to enhance its value in the eyes of the collector, it is exceedingly difficult to procure. I have more than once, after having, for an hour or so, silently watched from behind a tree a small pool of water frequented by this bird, seen it dive the moment after I had touched the trigger, and before the shot could reach it—in fact it is nearly as expert a diver as the little grebe (*Podiceps Nestor*), which is abundant here, and when wounded it seeks concealment among the aquatic plants, where it remains with the bill only above water, in which position I have found one with both wings and one leg broken. The sportsman is here apt to be surprised to see the goose, and whistling duck (*Dendrocygna Eytoni*) perching upon the tall trees surrounding the lagoon, enabled to do so with facility from the unusual smallness of the web connecting the toes. Flocks of ducks of various species occasionally paid us a visit, and now and then a white duck (*Tadorna Rajah*) made its appearance. But to communicate the various species of birds frequenting this piece of water, leaving out of the question those of the neighbouring bush, would be tedious to both of us.

Besides these birds, we occasionally met with a snake or monstrous lizard (*Monitor Gouldii*), about the margins of the lagoon, and on

more than one occasion in the water itself. This lizard, which attains the length of five feet, is perfectly harmless, and is much prized as food; while with respect to the snakes, it is fortunate that comparatively few are poisonous. One evening, while silently stealing along the water's edge to get a shot at a white duck, I inadvertently put my bare foot upon a small snake, which, instead of turning round upon me and biting, instantly dashed into the water and escaped.

After having afforded a morning meal to some thousands of hungry mosquitos, we usually proceeded homewards, when the sun was rapidly becoming too powerful for travelling under. Breakfast over, and our pipes lit, we proceeded to skin the spoils of the morning, an operation occasionally retarded by myriads of ants, attracted by the scraps of flesh. The bill, legs, feet, eyelids, &c. required to be washed over with a solution of corrosive sublimate, and it was also necessary that the under surface of the wing at the carpal joint and the tarsus (except in very small birds) should be slit up, the muscles and tendons removed, and arsenical soap applied. In the evening another visit was paid to the lagoon, and some more specimens procured; at sunset we returned, packed up the skins which had been drying in the sun all day, and adjourned to a huge fire upon the beach, around which was usually assembled a large and motly party of whites and blacks, men, women and children. The abundant supply of game and fish enabled us to maintain a bountiful table, and numbers of aborigines frequented our camp for a share of the good things. We took care to turn these *re-unions* to some account, by extending our acquaintance with their language, manners and customs. At an early hour we retired to rest *sub dio*; one slept in the boat anchored off shore thirty or forty yards, the other in his blanket laid himself down by the fire, and gradually fell asleep while concocting some ingenious plan for the extermination of the whole genus *Culex*.

And now having given you the bright side of the picture, the reverse I leave to your own fertile imagination.

JOHN MCGILLIVRAY.

Notes on Australian Natural History. By J. MCGILLIVRAY, Esq.

IN order to relieve the tedium of a passage by sea, I seat myself down to fulfil my promise of writing out a few more notes for the 'Zoologist.' Field naturalists are often led by the nature of their pursuits to become sportsmen, from a frequent use of that powerful auxiliary the gun, and, judging that some of your readers may have taken an interest in anything relating to Australian Zoology, I submit a short account from my journal of the modes of procuring the opossum and the small brush kangaroos.

In September, 1842, while at Hobart Town, one fine evening, a party of four was made up for the purpose of having a night's opossum-hunting, and crossed over to the eastern shore of the Derwent, when, at a farm belonging to Judge Montagu, we found the overseer and a party of convicts awaiting our arrival. The night was beautifully fine—one of those heavenly nights "not made for slumber"—the moon being about its full, and not a cloud to be seen. We had four or five dogs with us, curs of various descriptions, which were allowed to range about as soon as we had got half a mile from the houses. In the course of a few minutes we were delighted to hear one of them give tongue, and each of us, eager for the first shot, made off through a "scout" of young wattle trees (*Acacia affinis*) towards the border of a wood, where we found all the dogs assembled at the foot of a tall gum-tree, giving utterance to an occasional bark. An opossum had been found and pursued, until at length it took refuge in the tree. Here, being novices, we had some difficulty in seeing the animal, even by getting the tree against the moon, when the outline of every twig and leaf could be clearly made out. At length he was seen, a shot was fired, the dogs barked furiously and attempted to scramble up the tree,—he climbed a little higher,—another shot was more effective than the first, he hung suspended by the tail for a few minutes, and dropped to the ground—a fine Brush-tailed Opossum, (*Phalangista vulpina*). Soon afterwards we procured another, of the ring-tailed species, *Phalangista* or *Hepoona Cookii* or *Banksii*, for there is some confusion as to the nomenclature of this very common animal, which is much smaller than the other. Not long afterwards a large individual of the brush-tailed kind was found extended motionless along a branch, expecting us to overlook him, which however was not the case. Leaving the small hill on which we then were, we descended into a bottom, along which we walked for several miles

without hearing anything of the dogs, which had gone on before ; at length one gave tongue and the others joined ; we ascended a long acclivity, and on arriving at the top all breathless, found that the opossum had escaped, probably by leaping from one branch to another of some of the neighbouring trees. Several such disappointments occurred during the night, yet during our wanderings through the forest we managed to kill nine of the two species. About eleven o'clock, feeling rather tired, we got up a huge fire, and sitting down upon a log partook heartily of tea and damper, not forgetting some of the "Queen's own," our friends amusing us with stories about bush-rangers, in some of which I suspect they had themselves played a part. After this we made the best of our way back, occasionally getting a shot as we went along, and now and then stumbling over a stone or prostrate tree, and in due time reached our floating home. Some of the opossums were afterwards cooked, but the mess did not give much satisfaction, from the animals having lately fed upon the leaves of the peppermint-tree (*Eucalyptus piperita*), the peculiar and disagreeable flavour of which was partially retained by the meat.

In December, 1842, when I happened to spend some time at a farm upon the Paterson (a tributary of the Hunter, N.S.W.), I frequently visited a small patch of "brush" situated in an angle formed by the river and a shallow lagoon frequented by herons (*Ardea Novæ Hollandiæ* and *A. pacifica*), snipe (*Scolopax Hardwickii*), spur-winged plover (*Lobivanellus lobatus*), and other waders. The river was here brackish, yet the Platypus was occasionally to be seen among the weeds (*Myriophyllum*), and the rare *Plotus Levallantii* occurred now and then. That beautiful kingfisher (*Alcyone azurea*), was not unfrequent, and of an evening I have often seen the large purple gallinule (*Porphyrio melanotus*) feeding in the fields on the river banks. The "brush" in question was so densely overgrown with underwood that it was difficult to penetrate, and the prowling naturalist who took to it for shelter from the fierce rays of a meridian sun, with the thermometer from 85° to 90° or more in the shade, would most likely be driven out by clouds of mosquitos.

Here the night heron (*Nycticorax caledonicus*), breeds in the tallest trees, and pigeons and parrakeets of several kinds, with a multitude of other birds, were always to be found. In this secluded spot the small kangaroo, known to the colonists by the name of "Pade-melon," the *Halmaturus Thetidis* of Gould's Monograph, found an asylum. I had often caught a glimpse of this elegant creature, but could not for some time succeed in obtaining one ; I accordingly re-

solved to procure the aid of some blacks in the vicinity, in order thoroughly to beat the bush and have a grand field day.

One morning I started for the bush in company with rather a distinguished character, known by the inscription upon a semilunar brass-plate worn in front, to be "Tom, King of Dunmore." I could not help being amused at the ridiculous figure cut by my royal friend. He was entirely naked, with the exception of his back and part of the shoulders, to cover which some one had given him the wreck of an old shooting-coat—patches and streaks of white paint, the remains of last night's "corrobory," ornamented his face and legs, and he carried over his arm an old dragoon's carbine. At the encampment we fell in with the males of his party; one was searching for grubs in a rotten stump, another had smoked a ring-tailed opossum out of a tree and was skinning it, and the others had just returned from fishing. Round the waist they wore a belt of emeu skin, the two ends of which, cut into narrow strips, dangled down in front and behind. All were painted more or less with red ochre, some had their hair like a huge mop, others wore it tied up with grass in the form of a peak projecting backwards. Each man had several boomerangs and waddies in his belt, and carried a bundle of spears. Tom, having explained my business, a grand council was held on the edge of the brush, blankets were spread upon the ground, and a fire lit close by. By the distribution of some tobacco and the promise of more, I soon got into their good graces, and they agreed to accompany me. Meanwhile the dogs, of which there were many, were ranging about in the neighbourhood, occasionally starting one of the animals I was in quest of, judging from their barking. While I was waiting with great impatience until my sable friends had finished their smoking bout, a fine pademelon was driven close to us by the dogs, and came in sight, clearing the bushes in fine style, but, having my gun ready, I tumbled him over while making a flying leap. The astonishment of the group of natives seemed to know no bounds—they clapped their hands, laughed, and almost screamed with delight. By the time I had taken out the entrails, the whole party had got into motion, and we proceeded towards the centre of the brush. The dogs were running about in all directions, and we stationed ourselves here and there along the path made by the cedar-cutters many years ago. Every now and then I could catch a glimpse of one of the kangaroos hopping along in the thicket at which I was posted, halting occasionally, and sitting upright in the attitude of close attention. Now, a dog approached—

off bolted the pademelon, closely followed by the dog in full cry,—another joined in chorus, and the chase approached the margin of the thicket; a black, who for the last ten minutes had been standing motionless on one leg with uplifted arm, suddenly dropped his leg, and, advancing it one pace forward, delivered his spear, but without effect; now the terrified creature made a desperate bound across the path, but that was his last, for a charge of No. 5 shot cut short his career at the same moment that a boomerang from the vigorous arm of my neighbour struck the ground close by, and went off whizzing at a tangent, clearing my head by a few inches only. We rushed up in time to save the game from the dogs, when a tremendous report from a neighbouring thicket, followed by a low “cooey,” announced that King Tom and his carbine had been no less successful. I had scarcely reloaded, before another pademelon cleared the path at a couple of bounds,—by a short run I cut off an angle and took him in flank, while crossing a small opening. Bang! went one barrel—missed—bang! went another, and his hind legs were broken. Before I had my gun ready again he had got into the thicket,—on I rushed beating my way through the bushes, but a long creeper brought me up, and down I went on my face, nearly spraining my wrist while endeavouring to save my gun. By this time the whole cover had been drawn, and the inmates were scampering about in all directions chased by the dogs; and spears, waddies, and boomerangs were thrown in quick succession, but without much success. Meanwhile, I made my way for a thicket where everything was apparently quiet, and dropping on one knee, soon had the satisfaction of seeing a pademelon hopping along, pausing every now and then, sitting upright on his haunches to reconnoitre. Now is the time — the clicking of the lock caught his ear, and he turned his head downwards, preparing for a bound, but it was too late. Silently reloading, I kept the same position,—another and another hopped past, when a right and left stretched them on the ground. Having now obtained as many as I wished, I loaded myself and two lads with the spoil, and, leaving the blacks still beating the bush for their dinner, trudged slowly homewards. Three hours afterwards Tom rejoined me with two more pademelons, and sitting down, pipe in mouth, proceeded to skin them with a piece of broken bottle, quite as effective in his hands as a knife.

I now subjoin a brief account of the habits of this interesting animal. It inhabits the thickest brushes, issuing out to the borders and

open spaces to feed during morning and evening; I believe it also feeds during the night, for while encamped on Mosquito Island, at the mouth of the Hunter River, I have frequently after dark heard the *pat-pat* of leaping kangaroos, and only this and another, the black wallaby (*H. ualabatus*), are found there. It has a form like a hare, is extremely vigilant and swift, making short leaps, with tail extended and nearly touching the ground. If disturbed, it hops off with great rapidity, for a few yards, and then, if not pursued, stops and raises itself to a semi-erect position, attentively listening. If any noise is made, even the breaking of a twig or the rustling of a dead leaf, off skips the pademelon a little further, and then halts as before. I have sometimes come upon them while squatted under a heap of dead branches, expecting me to pass, but in general they are off upon the sound of approaching footsteps; I have also occasionally started them from off fallen logs. The young, from the pouch, if sufficiently grown to be able to eat grass, are easily reared, and soon become quite familiar.

Note on species of Velella and Glaucus.—One day while becalmed in the South Atlantic in lat. 23° S. and long. 25° W., with numbers of marine animals in the water all around, I caught some Velellæ and a Glaucus, descriptions of which I subjoin, as I cannot identify the species.

Velella mutica. The Velella, known to seamen as the “sallyman,” is sure, next to the Physalis or “Portuguese Man-of-war,” to attract the attention of the most incurious voyager in those seas which it frequents, from its beautiful blue colour and curious mechanism; the transverse membranous crest on the back acting as a sail, by communicating a slow, rotatory motion while drifting to leeward. Length $1\frac{5}{12}$ inches, breadth $\frac{1}{12}$, length of cartilaginous disk 1 inch, of ridge on ditto $1\frac{6}{12}$ inches, height of ridge $\frac{6}{12}$ inches. Skeleton composed of two portions, one, which may be called the disk, is horizontal, membranous, with an umbo and about twenty parallel concentric rugæ; it is crossed in its short diameter by a waving sulcus, with a slight emargination at its two extremities. Along the entire length there extends, in a slightly waving manner, a vertical, membranous, or almost horny transparent crest, rising to the height of half an inch, with a slightly waved margin, and a central projection with numerous, very faint, concentric, and still more obsolete centripetal rugæ. To the crest is attached a slight, minutely granulated, membranous fringe, extending about a line beyond the membranous border. To the lower surface of the disk is likewise attached a horizontal gelatinous

expansion, from one to three lines in breadth, and of a deep blue colour. The under surface is completely covered with tentacula, — a marginal row of them, about half an inch in length, forms a fringe of blue, annulated at the base with white, — the remainder are smaller and more slender, one to two lines in length, white or faintly tinged with blue. In the centre is a minute, tubular, prominent orifice (the mouth), half a line in diameter, of a bluish white colour. From this, as a centre, a dark-coloured elliptico-lanceolate body, three quarters of an inch in length, extends laterally, as viewed through the transparent covering; it is lodged in the hollow of the horizontal membrano-cartilaginous base.

Glaucus hexapterygius. A figure would convey, better than a description, a correct idea of the form of this singular creature, which I have somewhere seen called the "Sea Lizard." Below, the animal is furnished with a slightly developed foot, in the shape of an oval disk, not projecting beyond the margin. The lateral appendages are not quite symmetrical in the number of their divisions. The tentacula upon the head do not appear to be in any degree retractile. I observed it to be luminous at night, the flashes emanating from the central silvery streak upon the back. When at rest, in a vessel of seawater, the animal lies flat upon the surface with all its arms extended, but at times, its motions render it a most grotesque object, for the whole body is very flexible, and admits of both lateral and vertical motion. The Glaucus can turn round upon its back almost instantaneously, by bending downwards the arms of one side, and curving upwards those of the other. The digital appendages can be brought into play around a common centre, so as to grasp any object, and by this means, the animal can roll itself up into a kind of ball.

Food of the Petrel Family.—In the stomachs of individuals of the Fulmar Petrel (*Procellaria glacialis*), dissected by me at St. Kilda several years ago, I invariably found numbers of the horny mandibles of Lepiadæ. Since then I have examined others of the family, and generally with the same result. I allude particularly to the Cape Petrel (*Daption capensis*), two species of Albatross (*Diomedea exulans* and *D. melanophrys*), and a Puffinus from the N.E. coast of Australia. From this, it is probable that the Cuttle-fish family, which swarm in the Southern Seas, approach the surface chiefly at night, when the various oceanic birds above alluded to, are no less active than during the day, for marked individuals have been known to follow a ship for thousands of miles in her course across the trackless ocean.

Habits of two Crustacea of Port Jackson.—Two species of crabs are very abundant in Farm Cove, Port Jackson, and I have met with them elsewhere in Australia. Specimens of both, procured by me, have been presented by the Earl of Derby to the British Museum, and an account of their habits may prove of interest.

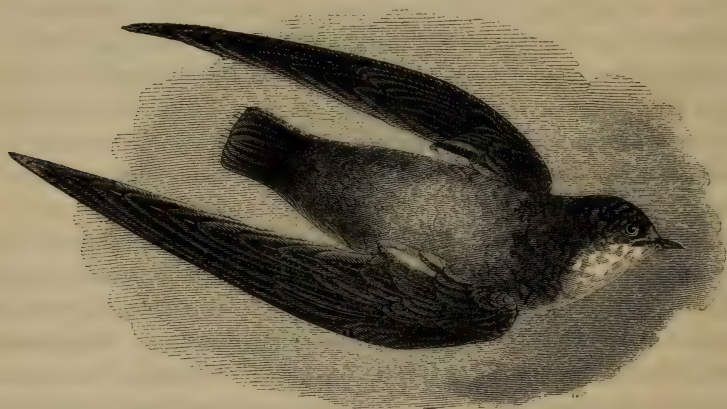
Mycteris longicarpis, Latr. The sandy flats left by the tide are often partially covered with large bodies of this beautiful crab, the colours of which (blue and white) I may mention cannot be preserved in a dried specimen. On walking up to one of the large congregations of this species—for several thousands are often assembled together—the whole make off in one direction, betaking themselves, as they proceed, to their holes in the moist sand. These latter are merely temporary, for when hard pushed, the crabs form, by a kind of circular or screwing motion, from right to left, a small perpendicular hole, into which they sink to a depth of two or three inches. This crab walks upon the tips of its claws, and, having long curved legs, the semi-orbicular body is raised high above the ground. It moves straight forwards, never sideways like many other Brachyuri, and is by no means swift in its movements. A smaller species of the genus, precisely similar in its habits, has received from Mr. McLeay the MS. name of *M. Latreillii*.

Gelasimus cordiformis, Latr. This curious little crab inhabits muddy flats by the shore which are left dry at low water, also salt marshes which are covered only at high tides, preferring the vicinity of fresh or brackish water, especially running streams. It is found in colonies, inhabiting holes in the mud, each of which harbours a male and female, and to these they retreat with great swiftness upon being disturbed. When pursued and overtaken, it erects its long first pair of arms, and, with outstretched forceps, bites most vigorously. Specimens from Port Stephens are nearly double the size of the Port Jackson ones.

JOHN MCGILLIVRAY.

On the occurrence of the Australian Spine-tailed Swallow in England. By EDWARD NEWMAN.

ON the 17th of July, I received through the kindness of Mr. Catchpool, a specimen of this remarkable bird, which had been shot in the neighbourhood of Colchester, and to which allusion has been made some months since, on the wrapper of the 'Zoologist.' The bird has been excellently stuffed by Mr. Hall, of the City Road, and is now returned to Mr. Catchpool, after having been examined by our eminent ornithologists, Mr. Yarrell, Mr. Doubleday, and Mr. Fisher, the last-mentioned of whom has most obligingly supplied me with the following description and figure.



The Australian Spine-tailed Swallow, (*Acanthylis caudacuta*).

"Length 8 inches. From the carpal joint to the end of the wing $8\frac{1}{2}$ inches. The first and second quill-feathers nearly equal in length, and the longest in the wing. The wings, when closed, extend full three inches beyond the spines of the tail. The length of the gape from the tip of the under mandible (which appears to be rather the longest) $\frac{7}{8}$ of an inch. Length of the tarsus $\frac{5}{8}$ of an inch, and of the middle toe to the end of the claw $\frac{3}{4}$ of an inch. The toes placed three before, and one behind, the latter being however situated not in the middle, but on the inner side of the shank.

"The beak short, very broad at the base, and black. Irides, [see Gould]. Front and upper part of the eye, bordered by a line of stiff, black, bristly feathers. Forehead grayish white; crown of the head,

back of the neck, upper tail-coverts, and upper side of the tail-feathers, shining brown, beautifully varied with purple and green reflections; back grayish brown, lightest in the centre; primary and secondary wing feathers dull brown, lightest on the inner web; wing-coverts darker; the innermost feathers of the greater wing-coverts being more or less white on the inner web, and the whole wing being varied with reflections of purple and green.



The Foot.

"The tail in form, almost square; the feathers ten in number, the shaft of each being carried beyond the web, and forming a short, sharp spine, which, in the central feathers, rather exceeds $\frac{1}{8}$ of an inch in length, and gradually diminishes towards the outside.

"The chin, throat, and under tail-coverts white; breast, belly, and under surface of the tail-feathers clove brown; flanks dark brown, spotted with white; legs, toes, and claws dark brown."

"It was shot about 9 p.m. on the 8th of this month (July) by a farmer's son, named Peter Coveney, in the parish of Great Horkesley, about four miles from Colchester; he saw it first on the evening of the 6th—he tells me it occasionally flew to a great height, was principally engaged in hawking for flies over a small wood and neighbouring trees; being only wounded, it cried very much as it fell, and when he took it up, clung so tightly to some clover (it was in a clover lay) as to draw some stalks from the ground; it is evidently nearly allied to the swallow, and its late feeding would perhaps show some affinity to the goat-sucker; the protruding shafts of the tail-feathers are singular.—*T. Catchpool, Jun.*"

The bird is well-figured by Mr. Gould in the 'Birds of Australia,' and greatly resembles Nipalese specimens, presented by Mr. Hodgson to the British Museum. I subjoin Mr. Gould's interesting description as well as list of synonyms.

"*Acanthylis caudacuta*, Australian Spine-tailed Swallow.

"*Hirundo caudacuta*, Lath. Ind. Orn. Supp. p. 57. sp. 1. Lath. Gen. Hist. vol. vii. p. 307. Vieill. 2nd. edit. du Nouv. Dict. d'Hist. Nat. tom. xiv. p. 535, and Ency. Méth. Orn. pt. ii. p. 531.

"*Needle-tailed Swallow?* Lath. Gen. Syn. Supp. vol. ii. p. 307. Steph. Cont. Shaw's Gen. Zool. vol. x. p. 133.

"*Pin-tailed Swallow*, Lath. Gen. Hist. vol. vii. p. 308.

"*Chætura australis*, Steph. Cont. Shaw's Gen. Zool. vol. xiii. p. 76.

"*Hirundo pacifica*, Lath. Ind. Orn. Supp. p. 58. Vieill. 2nd. edit. du Nouv. Dict. d'Hist. Nat. tom. xiv. p. 511, and Ency. Méth. Orn. pt. ii. p. 529.

"*New Holland Swallow?* Lath. Gen. Syn. Supp. vol. ii. p. 259. Steph. Cont. Shaw's Gen. Zool. vol. x. p. 132. Lath. Gen. Hist. vol. vii. p. 308.

"*Chætura macroptera*, Swains. Zool. Ill. 2nd. series. pl. 42. Gould's 'Birds of Australia,' pt. ii. cancelled.

"This noble species, the largest of the Hirundinidæ yet discovered, is a summer visitant of the eastern portion of Australia, proceeding as far south as Van Diemen's land, but its visits to this island are not so regular as to New South Wales, and its stay in these southern latitudes is never protracted. The months of January and February are those in which it has been most frequently observed in Van Diemen's Land, where it simultaneously appears in large flocks, which, after spending a few days, disappear as suddenly as they arrive. I am not aware of its having been observed in Western Australia, neither has it occurred in any of the collections formed at Port Essington.

"The keel or breast-bone of this species is more than ordinarily deep, and the pectoral muscles more developed than in any other bird of its weight with which I am acquainted. Its whole form is especially and beautifully adapted for aerial progression, and, as its lengthened wings would lead us to imagine, its power of flight, both for rapidity and extension, is truly amazing; hence it readily passes from one part of the country to another, and, if so disposed, may be engaged in hawking for flies on the continent of Australia at one moment, and in half an hour be similarly employed in Van Diemen's Land.

"So exclusively is this bird a tenant of the air, that I never in any instance saw it perch, and but rarely sufficiently near the earth to admit of a successful shot; it is only late in the evening and during lowering weather that such an object can be accomplished. With the

exception of the crane, it is certainly the most lofty as well as the most vigorous flyer of the Australian birds. I have frequently observed in the middle of the hottest days, while lying prostrate on the ground with my eyes directed upwards, the cloudless blue sky peopled at an immense elevation by hundreds of these birds, performing extensive curves and sweeping flights, doubtless attracted thither by the insects that soar aloft during serene weather; hence, as I have before stated, few birds are more difficult to obtain, particularly on the continent of Australia, where long droughts are so prevalent; on the contrary, the flocks that visit the more humid climate of Van Diemen's Land, where they necessarily seek their food near the earth, are often greatly diminished by the gun during their stay.

"I regret that I could ascertain no particulars whatever respecting the nidification of this fine bird, but we may naturally conclude that both rocks and holes in the larger trees are selected as sites for the purpose, as well as for a roosting-place, during the night. Before retiring to roost, which it does immediately after the sun has gone down, the Spine-tailed Swallow may frequently be seen either singly or in pairs sweeping up the gullies, or flying with immense rapidity just above the tops of the trees, their never-tiring wings enabling them to perform their evolutions in the capture of insects, and of sustaining themselves in the air during the entire day without cessation. The sexes offer no perceptible difference in their outward appearance; but the female, as is the case with the other members of the family, is a trifle smaller than her mate.

"Crown of the head, back of the neck, and ear-coverts deep shining green, strongly tinged with brown; a small space immediately before the eye deep velvety black; and across the forehead, throat, inner webs of the secondaries nearest the back, a patch on the lower part of the flanks and the under tail-coverts white; wings and tail deep shining green, with purple reflexions; centre of the back grayish brown, becoming darker towards the rump; chest and abdomen dark clove brown; bill black; feet brown.

"The figures are those of the male and female of the natural size."

It is interesting that the singular genus *Acanthyliis*, or Spine-tailed Swallow, occurs in North and South America, on the continent of India, in New Holland, and now in Europe. The type of the genus, the *Acanthyliis pelasgia*, is a smaller bird than the present, is a native of North America, and is figured in Wilson's 'American Ornithology,' pl. xxxix. fig. 1. I was at first induced to believe, that the bird now under consideration would turn out to be the North American species,

as we have lately had so many stragglers from that country, but a close examination and comparison, proves beyond doubt, that our bird is strictly identical with that described by Mr. Gould. Mr. Yarrell informs me that the Australian and Indian species are not identical.

EDWARD NEWMAN.

Peckham, September, 1846.

Curious capture of the Goshawk.—I was so fortunate at the beginning of this year as to obtain a goshawk, caught in the following curious manner: the hawk was perched on a gate-post, so intently watching a flock of starlings, that he did not perceive the approach of a man, who captured him by seizing his legs.—*George Horn; Egham, June, 1846.*

Nesting of Montagu's Harrier in Norfolk.—On the 23rd of May I took a nest of this rare bird with two eggs in it, and on the 13th of June another nest with two eggs also; the eggs in both were quite fresh, and there would probably have been five in each. The nests were composed of dead grass and sedge, laid loosely together on the ground. The eggs in one nest were spotted with brown.—*C. B. Hunter; Downham, Norfolk, August 23rd, 1846.*

Occurrence of the Great-horned Owl at Hampstead.—On the 3rd of November, 1845, my father preserved for Mr. Burgess, Temple House, Hampstead, a female specimen of the great-horned owl (*Strix Bubo*); it was caught, after much trouble, in a hedge near the house, and was kept for some time, and until it died: it was very fierce during its captivity, and had been severely wounded in the wing by shot previously to its capture.—*Thomas Hall; 7, City Road.*

On the occurrence of Parti-coloured Song Thrushes.—On the 18th of last June, William Marshall, of Bunton, near Pontefract, found in a hedge at that place a nest of young song thrushes which were colored black and white. There were four in the nest at the time; the colors were differently disposed on each; the greater part of one bird was white, the others had more of black, but none were of the usual colour. The birds are still in the possession of the finder.—*Henry Thompson; Ackworth, July 14th, 1846.*

Early arrival of the Chiff-chaff near Swansea.—Having read in the June number of the 'Zoologist' a notice of the early appearance of the chiff-chaff at Penzance, I beg to inform you that it was first heard by myself and others in the neighbourhood of Swansea on the 30th and 31st of January, from which time its note was frequently repeated.—*Arthur Berrington; Swansea, July 7th, 1846.*

Singular variety of the Wheatear (Motacilla Enanthe).—A singular variety of this bird was shot at Spetchley, about four miles from the city of Worcester, on the 28th ult., by R. Berkeley, Esq., of Spetchley Park, who presented it to the Worcestershire Museum. The black streak over the eyes, cheeks, and ears is gone, but there is a slight trace of the white line; the flight feathers and wing coverts are white, edged with a kind of buff; the rump and part of the tail is white, as in ordinary birds of this species, but all the rest of the plumage of this specimen is a kind of buff.—*George Reece; Worcester.*

Note on the early breeding of the Bearded Tit.—A nest of the bearded tit containing five eggs was brought to me last April. It had been taken on the 15th of that month, at Hoveton, near Horning in Norfolk, and the eggs would have been hatched in three or four days from that time. Allowing eight days for the completion of the nest, five for laying the eggs, and thirteen for incubation, the nest must have been commenced about the 23rd of March, the usual time being about the end of April. This unusual circumstance was, no doubt, produced by the mildness of the early spring.—*John Smith ; Great Yarmouth, July, 1846.*

Frequent occurrence of the White Wagtail in Kent.—My attention having been drawn since the publication of Mr. Yarrell's 'Supplement' to the white wagtail (*Motacilla alba*). I find they are very common in this part of Kent, as I seldom pass a day without seeing several pairs, though I have not yet been able to get their eggs.—*F. Plomley ; Lydd, Romney Marsh, Kent.*

Occurrence of the Crested Lark (Alauda cristata), near Penzance.—Two examples of this bird have come to my notice during the present month ; thus forming another addition to our Cornish Fauna. They were shot by Mr. Vingoe, of this place, who detected them on a stone wall on the road-side, between Marazion and this place. His attention was directed to these birds by the melodious quality of their notes, resembling more in character the flute-like tones of the woodlark than the buoyant song of the skylark. The crest in both specimens is very well developed, and the form of the beak, and the comparative shortness of the hind-claw, as compared with our larks, are remarkable characters. Both specimens now under notice are male birds.—*Edward Hearle Rodd ; Penzance, September 19th, 1846.*

Occurrence of the Red-billed Whidah Bird in Kent.—On the 2nd of July a bird was brought to me, killed in this neighbourhood, which I immediately recognized as the red-billed whidah bird (*Emberiza vidua*, Linn.) On examination, it proved to be a male, with its crop full of the seeds of the meadow soft grass (*Holcus lanatus*), and in perfect plumage, the tail feathers being eleven inches in length ; at first I thought it might have escaped from confinement, but its feathers were so perfect that I am satisfied it came borne by the strong westerly winds then prevailing, from the north-west coast of Africa, and I believe it to be the only specimen killed in England or in Europe.—*F. Plomley ; Lydd, Romney Marsh, Kent.*

Nesting of the Lesser Redpoll in Norfolk.—Three nests of the lesser redpoll have been taken in this neighbourhood and two near Thetford during the past season. The two latter were on some small beech trees.—*C. B. Hunter ; Downham, Norfolk, August 23rd, 1846.*

On Redpolls staying at Thetford throughout the summer.—I have felt sure, since last year, from the fact of several redpolls staying in this part of the country throughout the summer, that they must have bred or been reared hereabouts ; but I was not, until this month, made perfectly certain of it. A nest, containing six eggs, was taken at Burham on May the 14th. The nest and three of the eggs were brought to me at the beginning of this month, and the former, which is now before me, I will proceed to describe. It is about $1\frac{1}{2}$ inch in diameter and depth (inside) ; the walls are about $\frac{3}{4}$ inch in thickness, and are composed of an out-work of twigs, wool, and the stronger stalks of grasses, the nest is lined with fine grass, pulled wool, and a few feathers and horse-hairs. It was built against the trunk of a larch tree at about six or seven feet from the ground. The eggs almost exactly resemble the one figured by Mr. Hewitson, being however of a paler blue. It

will be seen that the above description differs much from that of Bewick, although it resembles those of Yarrell, Selby, and Hewitson. I have also seen another nest, which was very like the one here described, and was similarly situated on a spruce fir; it was taken this summer in the neighbourhood. On the 24th of June I had a young one, which could hardly fly, and was knocked down with a stick, brought to me, and as no author that I can find has described the nestling plumage, I venture to do so here:—Beak pale brown; upper mandible rather the darkest; head and nape dirty white, each feather having a dark centre; back and tail-coverts dark brown, each feather margined with sienna; neck, breast, and flanks dirty white, each feather tipped with dark brown, a tinge of sienna pervading the former; belly, thighs, and under tail-coverts silvery white, the latter with a dark stripe on each feather; first ten of the eighteen quill-feathers (wing) grayish black, the remainder the same, but with a broadish buff outer edge; tail-quills the same as these last; first and second wing-coverts dark brown with buff tips, forming two conspicuous bars across the wing; inside of the bastard wing tinged with sienna; tarsus and toes pale brown; claws black. Last summer a pair of these birds haunted this house, and the female used often to come and sit upon a cage, which stood at the open window, containing a pair of these pretty little linnets, who seemed always much pleased with their visitor. Several other birds of this species were often seen about in the neighbourhood at Thetford, Barham, Calford, &c. Elden is, I believe, nearly in the same latitude as Rugby, which has been considered the most southern limit of this bird's habitat in summer.—*Alfred Newton; Elden, June 29th, 1846.*

Occurrence of the White-winged Crossbill near Thetford.—Four or five of these birds were observed on some fir-trees near Thetford, in Norfolk, on the 10th of May last; one of which was shot, and came into the possession of Mr. Robert Reynolds, bird-fancier, of Thetford. About a week before this, Mr. Reynolds purchased a specimen of a bird-stuffer at Bury St. Edmund's, which had but just been set up, and was obtained in that neighbourhood.—*C. B. Hunter; Downham, Norfolk, August 23rd, 1846.*

Remarks on the Nuthatch.—A discussion respecting the food and habits of the nuthatch has lately been carried on through the medium of that useful journal, called the 'Gardener's Chronicle,' in rather too angry a tone, and as I do not wish to be involved in a controversy upon the subject, I prefer recording in the pages of the 'Zoologist' the few facts relating to that bird, which I have to communicate. That it feeds upon nuts there cannot, I should imagine, remain in the mind of any accurate observer of Nature even the shadow of doubt, but if any further confirmation of the fact be wanted, I beg to state, that I have often been an eye-witness of its successful perseverance in cracking the shell by repeated strokes of the beak, and of its subsequent indulgence in devouring the well-earned prize of the kernel. The first of these operations it performs in a manner very different from the oxeye tit (*Parus major*), which I have often detected in similar occupations, for the nuthatch not only pecks it with the beak as the latter bird does, but brings the whole of its body into action by expanding its wings at every stroke. Doubtless, the beak appears almost too tender to be so employed, but we know that drops of water by falling on the same place will wear a hole in the hardest stone; thus, repeated blows of this apparently feeble instrument upon the same part of the nut-shell will speedily produce the desired effect. Nuts, however, are not the only article of food to which the nuthatch has recourse. It devours insects in abundance, and I have lately had a proof of its partiality to fruit also. On the 15th

of August, my gardener informed me that "scores of nuthatches" had for several successive days visited the currant-trees in my garden and robbed them of the fruit. I must confess, that in the first instance I was somewhat incredulous, especially as no birds of the kind had been seen here for the last two or three years; but I was soon satisfied of his accuracy as to the species, for upon going with him I saw several, and some were subsequently shot. There was something remarkable in the mode in which these little birds helped themselves to these rarities; they assembled in the first place in the branches of some apple-trees, which stood among the currant-bushes, and did not fly from thence to the latter, but ran down the trunk of the trees, head foremost, and then picked the fruit from the bushes and flew off with them. Some authors assert that nuthatches have only a note in spring and are mute during the summer, but these whilst engaged as above, emitted a low chirp, somewhat resembling the chiff-chaff's note, but less sharp.—*Oswald Mosely; Rolleston Hall, near Burton-on-Trent, September 3rd, 1846.*

[The reader is referred to an admirable paper on the habits of the nuthatch, by the Rev. J. C. Atkinson in an early number of the 'Zoologist' (Zool. 213): the fact that it feeds upon nuts is there placed beyond the possibility of a doubt. Sir Oswald Mosley's interesting observation of its feeding also on currants, is, I believe, new; but with regard to feeding upon nuts, I have so frequently been an eye-witness to this operation, that I supposed, and I still suppose that no *naturalist* could doubt it. The nutshells fixed in the crevices of the bark, the attitude of the bird while hammering them, and the sound of the hammering are as familiar to every out-of-door's observer as the song of the nightingale, the slovenly nest of the woodpigeon, or the compact one of the long-tailed titmouse.—*E. N.*]

Occurrence of the Crimson Weaver Bird in Kent.—Some years since, after a strong westerly gale, the short-tailed crimson weaver bird (*Euplectes ignicolor*, Swains.) was killed in this locality.—*F. Plomley; Lydd, Romney Marsh, Kent.*

Enquiry respecting the name of a Bird.—I have seen a bird flying swiftly from a hedge near this place: it was rather larger than the common shrike, and appeared of a bright scarlet all over. I shall be much obliged to any of your correspondents, who can from this imperfect description furnish me with the name of the bird.—*James Stuart Wortley, Winchester.*

[Was not this the Weaver Bird?—*E. N.*]

Singular habit of the Swift.—One of the last days of the sixth month, (June) 1835, a friend who was staying with us, my brother and myself went to spend a day at Walton-on-the-Naze, a small watering-place on the Essex coast. The day was wet and cold, particularly so for the time of year, but our object being more the pursuit of Natural History than the usual sea-side attractions, we were quickly out of sight of the village, climbing about the high cliffs to the north. Our attention was soon directed to a common swift which had just entered a small crevice; it flew away before we could reach. But almost directly after, we saw others clinging to slight projections and settling on the ledges, and so entirely did they appear weakened by the low temperature of the atmosphere, that they allowed themselves to be taken by the hand without the least struggle to escape; in some places they were settled one upon another, four or five deep, and we literally took them up by handfulls, five or six together. So numerous were they, we could probably have caught some hundreds, but having secured about thirty in a basket, we carried them home with us in the evening, and having placed them in a warm situation during the night, in the morning they

were strong enough to fly away, with the exception of two which had died. Many readers of the 'Zoologist' will be better able than I am to form an opinion whether the circumstances related, at all favour the views of those who advocate the hybernation of different birds, but I think they prove that birds of the swallow tribe do occasionally congregate for the special object of warmth, and I would suggest that like circumstances have probably given rise to that idea.—*T. Catchpool, Jun., Colchester.*

Note on a White Swallow.—On Tuesday last, a swallow perfectly white, was shot at Stoke Holy Cross.—*The Universe, September 18th, 1846.*

Is the tumbling of Pigeons a natural or acquired habit?—A short time since, while sitting in the garden with a little boy about six years of age, his attention was attracted by some pigeons which repeatedly flew over, and amongst them were some "tumbler," these more particularly caught his notice, from their characteristic habit of turning over in the air, and he said "Papa, are pigeons taught to do so?" I answered on the instant "No, it is a habit natural to a particular kind of pigeon, known as "tumblers." Thinking it over since, I have doubted how far my reply was correct, and should be glad if any of your various correspondents would give, through your columns, a reply to the child's query, more satisfactory than the one I gave has proved to my own mind. If our various kinds of dove-house, or domestic pigeon, are all (as has been supposed) descended from the wild pigeons of the wood and forest, it is a subject of curious enquiry, how this "tumbling" propensity was generated? or whether it has ever been noticed in any of the free-born inmates of the "Woodland Wild?"—*E. R. Foster; Camberwell.*

Note on the Pheasant.—About the middle of the last summer, the occupants of a farm-house in the adjoining hamlet of Kermincham, were much surprised one day to see a fine cock pheasant strutting about with the hens in the yard, and apparently as much at home, as any of his domesticated companions. In the evening he retired to the woods to roost, and made his appearance again in the morning by daybreak, and this was carried on with great regularity for several months; in fact, I am not certain whether his visits have yet been discontinued. There was no reason to suppose that the bird had escaped from confinement. The farmer informed me that he was frequently seen *in coitu* with the hens, but the eggs were invariably barren.—*T. W. Barlow.*

Occurrence of the Buff-breasted Sandpiper (Tringa rufescens), at Penzance.—I am enabled to add the above rare *Tringa* to our Cornish fauna, by the capture of one on the sands between this place and Marazion on the 3rd inst. The bird was flying in company with dunlins and ring plovers, and was killed with several of the above birds. The plumage of the bird seems to agree so entirely with Mr. Yarrell's specimen (which was obtained at the same period of the year) that it would be unnecessarily filling your pages to enter into a full description of its plumage. The specific characters which distinguish this species from the other species of the family, are clearly defined in the under surface of the wings.—*Edward Hearle Rodd; Penzance, Cornwall, September 19th, 1846.*

Occurrence of Sabine's Snipe near Clonmel.—I have just received a specimen of Sabine's snipe; it was shot on the 31st of last month in a bog near New Birmingham, about sixteen miles from this place by J. Morton, Esq., of this town. It was in company with a common snipe, and rose with it; its cry was similar to that of the common, and but for which cry it would have escaped, being on first rising mistaken for a water-

rail, and allowed to go a considerable distance. Unfortunately, the specimen did not reach me for five days afterwards, when it was of course, "far gone." It appears to be a male bird, and was moulting, which will probably account for the fourth wing-feather being the longest. Yarrell, says the tail consists of twelve feathers, and that two of the toes are united for a short distance; in this specimen they are divided to the origin, and the tail, now consists of thirteen feathers; some grains of shot passed through these, and probably cut away another feather. I have preserved the skin.—*Robert Davis, Jun. ; Clonmel.*

Note on the sound produced by the Common Snipe.—Two of your correspondents (Zool. 1192 & 1372) have called in question Mr. Bree's assertion, that the sound produced by the common snipe is sometimes emitted whilst the bird is on the ground. This noise has been described by various writers under the somewhat opposite names of "drumming," "humming," "bleating," and "whorring." I do not mean in any manner to dispute Mr. Atkinson's assertion as to the powers of ventriloquism possessed by birds, but the fact is, that the snipe produces *two* distinct sounds; the one, which as Mr. Atkinson observes, much resembles the buzzing of a large bee, I have only heard when the bird was in the air, and descending rapidly; the other, possibly that referred to by Mr. Bree, under the term "whorring," I have thought to be in some degree similar to that produced by the sharpening of a saw, but with little of the unpleasant harshness; and I can state with certainty, from the most careful observation, that during the time of its emission, the snipe is not in the air, but on the ground. I may add, that having on one occasion approached sufficiently near to obtain a full view of the bird, I was able to see that its production was unaccompanied by any motion of the wings.—*William R. Fisher ; 5, Verulam Buildings, Gray's Inn, July 6th, 1846.*

Longevity of the Oyster Catcher.—My father stuffed a specimen of the oyster catcher for a Mr. Robinson, who had it alive in his possession for thirty years.—*Thomas Hall ; 7, City Road.*

Occurrence of the White Stork near Driffield, Yorkshire.—As I see a notice of the white stork in the last number of the 'Zoologist,' I beg leave to inform you that a specimen was seen this spring on the Driffield stream, below Wansford, in this parish, by two gentlemen, Mr. Fife and Mr. G. Reynard, by whom I was informed of the circumstance.—*F. O. Morris ; Nafferton Vicarage, Yorkshire.*

Occurrence of the Egyptian Goose in Kent.—A flock of five of the Egyptian goose (*Anas Egyptiaca*, of Bewick) have been ranging about Romney Marsh for some few days, but so wild that a specimen could not be obtained; these birds were formerly very common, and are well-known to the old wild-fowl shooters by the name of the "Crocker Goose."—*F. Plomley ; Lydd, Romney Marsh, Kent, July 18th, 1846.*

Occurrence of the Gray Goose and Cornish Chough near Holmes Chapel.—A fine specimen of the gray goose (*Anser palustris*), and also another of the Cornish chough, have been lately taken near here. Both are great rarities with us.—*T. W. Barlow ; Holmes Chapel, near Middleswich.*

Occurrence of the Black Swan (Cygnus Atratus, Bennett), in Scotland.—A beautiful specimen of this bird was shot by Mr. Philp, Kincapple, on the river Eden, in the latter end of last month. After following it for several miles up the river, he got sight of it in a creek near Niddry Mill, and stalked it in a sportsman-like manner. We believe this is the first black swan shot in a wild state in Great Britain, if not in Europe. The bird in question is a female, and weighed nine pounds, three ounces ;

measured three feet, nine inches in length, and six feet in extent of wing. The black swan was for many ages considered fabulous, but is by no means "*Rara avis in terris*;" it is a native of Australia, where it abounds in the rivers and lakes, and on various islands on the coast, and is usually seen in flocks, which are very shy and watchful. Of late years this bird has been introduced into our island, where it thrives and breeds. The whole plumage is black, with the exception of the primary quills and a few of the secondaries, which are white, but are obscured by the tertials, which are curled, and hang plume-like over them; the bill is bright red, crossed by a whitish band near the nail, the irides are red, nostrils pervious, tongue slightly ciliated, trachea simple, and enters the breast in a straight line. The above specimen is tastefully stuffed by Mr. Stirling, of St. Andrew's, and we understand that Mr. Philp intends to place the bird in the collection of the Library and Antiquarian Society of that city.—*Scotsman*.

[A correspondent informs me that fifty or sixty years ago, *i.e.* before the black swan was brought here from Australia, a man who lived at Keswick, near Norwich, who was employed by the late Mr. Richard Gurney, and who never could have heard of the Australian swan, saw, what he always asserted to have been a flock of black swans; he followed them a long way with his gun, but was unable to kill any.—*E. N.*]

Occurrence of the Little Auk near Downham, in Norfolk.—An adult specimen of the little auk was obtained near this town during the second week of July. It was in an extremely emaciated condition when taken.—*C. B. Hunter; Downham, Norfolk, August 23rd, 1846.*

Stormy Petrel in London in 1824.—My father had a specimen of the stormy petrel brought to him, which had been found alive in the Old Street Road.—*Thomas Hall; 7, City Road.*

The effect of captivity on the appetite of Birds.—"The want of exercise, &c. and the change of habit, altogether tend to change the very nature of the stomach, and to cause it to accommodate itself to aliment which it would never touch in a wild state." This very veritable assertion Waterton makes in the second series of his 'Essays,' whilst refuting the general carnivorous nature of the squirrel. I have three birds, which prove the aforesaid assertion; my daw will eat, with great apparent zest, pickles of various sorts, cucumbers, cauliflowers, &c. all hot and spicy, both he and the magpie are especially fond of spiced gingerbread, and my windhover hawk will eat boiled mutton and raw fish, (but cares little for his more natural food of snails and slugs), all of which things, each would doubtless reject untasted in a wild state; my magpie too will catch and kill mice with surprising agility, and eat them afterwards, burying the superfluity. I know a parrot also that will eat salt bacon like a plough-boy, and his natural food is seeds and fruits.—*H. Daniels; Exeter, September 21st, 1846.*

Birds at Sea.—A very intelligent person, whose life has chiefly been spent at sea informs me, that he has occasionally seen birds on his voyages. Once, when mid-way in the British Channel a pied wagtail (*M. alba*) settled upon deck, which was caught. When on a voyage to India, and far out at sea, a sparrow-hawk came and settled on the rigging. A boy was sent up for it by the captain, but after he had laid hold of the bird, it clutched him so severely with its talons, that he left his hold and the bird escaped. In ten minutes afterwards, the hawk again came and settled on the rigging. The captain then sent up the boy with some biscuit, which the poor bird ate most greedily, although so different to his usual food. He was afterwards caught and kept

until the vessel made land. On another voyage when the ship was near Lisbon, a large flock of swallows came and settled on the rigging. They were four or five hundred in number, and clung and clustered to the shrouds in a remarkable manner. The time was the last week in April, and although late for the migration of these birds to our shores, they were, doubtless, on their passage to them. After recruiting themselves, they again took wing and continued their route. A redbreast also came and settled on the deck of the vessel when it was about seventy miles from land, probably driven out to sea by high winds which were blowing at the time.—*J. J. Briggs ; King's Newton, Melbourne.*

Alligator Oil.—A letter from St. Augustine, dated April 12th, says:—"I suppose that you may not have heard that we have discovered the utility of alligators. An alligator is found to be as valuable in his way as a spermaceti whale. An expedition has left this place for the River of St. John's and the dark tributary stream of Black Creek, swarming with these hideous creatures, with the view of killing them to obtain their oil. The oil of the alligator is said to be better for lamps than even whale oil; and it is extracted from the animal in considerable quantity, and without any great difficulty. For this discovery we are indebted to the Indians, who have been in the habit, for how long a time I know not, of extracting the oil of the alligator and using it for various purposes. It makes a fine transparent fluid, and burns admirably. You know how many of these enormous animals are shot, out of wantonness, from the decks of the steamboats that plough our waters. I expect hereafter to hear of laws passed for their protection. Every time an alligator of eighteen feet long is shot in the long grass of the river banks, or while he is swimming, a barrel, or half a barrel of oil, as the case may be, is wasted. This should not be. We must allow them to be killed only at a proper season, when they are fattest, and not permit their destruction at the season when they lay their eggs. The alligator is a formidable-looking creature, it is true, but he is generally harmless. His office is to prowl in the sluggish waters of this southern region, pick up what he can, and digest it into excellent oil for the illumination of our houses. Alligators will be hereafter esteemed as useful animals as pigs,—perhaps more so, for their keeping costs nothing. The danger is, that, now that the world has discovered what they are good for, their race will be exterminated."—*Montreal Times.*

Cornish Reptiles.—Since the publication of the portion of the 'Fauna' enumerating the Cornish reptiles, Bell's work on this portion of our Zoology has appeared, and this is I suppose the reason, why only one species of lizard is mentioned by Mr. Couch. Both are found in the county. I have met with both *Lacerta agilis* and *Zootoca vivipara* in the neighbourhood of Truro. For the same reason with the above, the only species of *Lissotriton* mentioned by Mr. Couch is *Lissotriton punctatus*. I have found *Lissotriton palmipes* (Bell), near Truro.—*Robert L. King ; Grammar School, Truro.*

Food of Slugs.—That slugs are highly carnivorous is well-authenticated, and many instances of that fact have been published in the 'Zoologist.' In addition to their recorded bill of fare, I have observed them in several instances feeding on orange-peel; and twice seen sufficient to convict them of cannibalism. The first in-

stance of the kind occurred May 7th, when I found two of the common field slug (*Limax agrestis*), making a meal on the crushed remains of a large black one (*Arion ater*); and on May 18th, I have the following in my note-book:—"Very wet, walked out to Benton in the evening, I again noticed the common field slugs (in two instances) feeding on the crushed remains of large black ones, in one of which some small spark of life yet lingered." I may here remark, that slugs were in immense abundance during April and May. I know of many instances where fields of oats, peas, and tares were completely destroyed, and had to be ploughed down and resown with tares or barley. In gardens they were equally prevalent and destructive; a friend of mine destroyed some thousands in a garden of small extent, merely by laying leaves of cabbage and other plants on the ground; collecting them every morning and destroying them with boiling water.—*Thomas John Bold*; 42, *Bigg Market, Newcastle-on-Tyne, September 3rd, 1846.*

Occurrence of Vanessa Antiopa at York.—A specimen of this rare British butterfly was brought to me alive this day, which was caught in a garden in the suburbs of this city; it and two others were flying in company with the red admiral (*Vanessa Atalanta*). The captor was unsuccessful with the others, he being only provided with a rhubarb leaf, with which he knocked the one down, that is now in my possession.—*Robert Cook*; *Colliergate, York.*

Occurrence of Vanessa Antiopa near Epping.—A female specimen of this insect was captured here on the 12th instant, and another seen. A fine female was also taken about the same time, near Yaxley.—*Henry Doubleday*; *Epping, September 20th, 1846.*

Occurrence of Vanessa Antiopa at Winchester.—On Friday, September 4th, I had the pleasure of taking a fine female specimen of this rare and beautiful insect, near some willows; I have seen three others near the same spot.—*John T. Rogers*; *North Walls, Winchester.*

Capture of Vanessa Antiopa near Stowmarket.—Entomologists will be pleased to hear that they have now an opportunity of witnessing in a fine and perfect state a specimen of the splendid butterfly, "*Vanessa Antiopa*"—*Camberwell Beauty*. A pair of this fine species were caught on Wednesday last, in the grounds of the Vicarage, Stowmarket, which, from their rare appearance, are rendered exceedingly interesting and remarkable. Their visits here appear to be at very remote and uncertain periods, for until four or five years previous to 1819, *Vanessa Antiopa* had not been seen for nearly forty years, when it was observed in abundance in various parts of the kingdom. In 1819, a few were caught in Suffolk, and one was taken in the following spring, which had lived through the winter; since that period it has not been seen in England. Those caught at Stowmarket were found on the mulberry-tree, near the Vicarage House, planted by Milton, during his residence with the Rev. Dr. Young, the then vicar, and who was tutor to the immortal poet, and no doubt the wide-spreading branches of this celebrated tree attracted the notice of the butterflies in their search after food. We have been informed that Dr. Probart captured one of these beautiful insects in his garden one day last week.—*Ipswich Paper.*

NATURALIST'S CALENDAR FOR NOVEMBER.

BIRDS.—In this month vast flocks of ducks and geese arrive on our shores; the gray-lag goose (*Anser cinereus*) is now become very scarce, and but few specimens are met with. In sharp winters the pink-footed goose (*Anser brachyrhynchus*) is not uncommon, but is often confounded with the bean goose (*Anser segetum*). The brent goose (*Bernicla Brenta*) seems principally to frequent the eastern, and the bernicle (*Bernicla leucopsis*), the western shores of Britain. The equatorial movement of all the birds is completed, and they remain stationary, till the return of spring again urges them to return northwards, and disperse during the breeding season.

INSECTS.—Are now becoming scarce, but some may yet be found. The little winter moth (*Cheimatobia vulgaris*) is found in profusion in gardens, and along white-thorn hedges; and the beautiful and variable umber moths (*Hibernia defoliaria*, and *H. aurantiaria*) are not uncommon in woods, and may often be seen resting upon the trunks of trees. The female of the former is quite apterous; that of the latter has rudimentary wings. They continue to appear till the end of the year. *Pæcilocampa Populi*, frequently called the "December moth," now appears, and the males very often enter houses, attracted by the light. *Petasia cassinia* may sometimes be met with in the same way, but is far more uncommon. Many Coleoptera may be found at the roots of trees, and among moss: the minute species are easily detected, by shaking the moss over white paper. Many pupæ of Lepidoptera may also be found by digging carefully round the roots of trees, but numbers are destroyed by shrew mice. Now is also the best time to search for the cocoons of the smaller species of *Ceruræ*, as they are very frequently destroyed by something during the winter, apparently mice. The cocoons of *Cerura furcula* are mostly found upon the trunks of the various willows; those of *C. bifida* upon aspens and other species of poplar.—*Henry Doubleday; Naturalist's Almanack for 1845.*

Occurrence of Argynnis Lathonia near Norwich.—Two good specimens of *Argynnis Lathonia* have been taken, and others seen at Harleston, near this place.—*Chas. Muskett, Norwich, October 9th, 1846.*

Occurrence of Argynnis Lathonia near Dover.—A friend of mine, Mr. Greenwood, of Chelmsford, has captured three specimens of *Argynnis Lathonia* near Dover this autumn.—*J. J. Weir; 17, Grosvenor Park, Camberwell, September 21st, 1846.*

Capture of Apatura Iris at Poynings.—In the early part of July I took a fine male specimen of *Apatura Iris* at Poynings, about six miles from Brighton. At first I noticed it flying very swiftly about a cottage, but at length it settled in a ditch, where I captured it.—*John N. Winter; North Walls, Winchester, September 5th, 1846.*

Occurrence of Vanessa Antiopa near Lincoln.—I have just received a letter from a friend, who informs me that he captured a fine specimen of *Vanessa Antiopa* in his garden at Lincoln, in August last.—*W. F. Evans; Admiralty, Sept. 17th, 1846.*

Capture of Vanessa Antiopa at Camberwell.—A specimen of *Vanessa Antiopa* was taken on the 12th inst. in a garden at Herne Hill, Camberwell, flying in company with *V. Atalanta*, but was unfortunately injured in capturing.—*W. J. Wild, East Dulwich, Sept. 18th, 1846.*

Capture of Vanessa Antiopa at Ipswich.—On the 31st of August, a fine specimen of *Vanessa Antiopa* was captured by my cousin, R. J. Ransome, in a garden at Ipswich; it was resting on a honeysuckle.—*R. C. Ransome, September 13th, 1846.*

Capture of Vanessa Antiopa at Kensington.—I yesterday obtained a specimen of this rare butterfly that was captured about a week since in an orchard at Kensington; it was taken in company with *Atalanta*, feasting on some rotten fruit that lay under some trees, by a man working in the garden. This warm season has been, apparently, peculiarly favourable for the production of this insect, it having appeared in various parts of England. I have heard of more than a dozen specimens having been seen or taken in the counties of Suffolk, Essex, Norfolk, Cambridge, Surrey, Sussex, Nottingham, and Isle of Wight, also at Limehouse and West India Docks. I have a very fine one, taken in a garden at Worksop, Notts.—*Samuel Stevens; King Street, Covent Garden, September 22nd, 1846.*

Occurrence of Vanessa Antiopa at Tottenham and at Streatham.—Two specimens of *Vanessa Antiopa* have been caught at Tottenham, and one seen at Streatham during the present month; the last-mentioned was resting on the sill of a window.—*Edwin Fox; 14, St. Helen's Place, Sept. 25th, 1846.*

Occurrence of Vanessa Antiopa in the Isle of Wight and near Leatherhead.—In addition to the several instances of the capture of *Antiopa*, which will doubtless reach you, I can mention some other localities where it has been seen, though I am sorry to say, not been secured. Two have occurred at this place—viz., one on the 13th of August, and another about three weeks after, on an apple-tree in the garden. On the 23rd and two following days, an *Antiopa* was observed in St. Boniface Garden, at Ventnor, Isle of Wight, on the fallen peaches. On the 3rd of September, as I was on my way to Mickleham on the top of the coach, I myself saw a splendid *Antiopa*, by the side of the road between Kingston and Leatherhead, which, from its richness of colouring, appeared to be newly born; the borders of its wings were as white as snow.—*J. F. Dawson; The Woodlands, Clapham, Beds. Sept. 28th, 1846.*

Occurrence of Vanessa Antiopa near Leicester.—This butterfly has extended its range this season, so far north, as to come within the list of our rare local insects, a specimen having been taken in September, by an entomologist at Branstone Wilderness, about two miles from Leicester.—*John Plant; Leicester, Sept. 28th, 1846.*

Occurrence of Vanessa Antiopa near Woburn.—I have just received a fine specimen of *Antiopa*, caught last week by a non-entomological friend, near Woburn, in Bedfordshire.—*J. F. Stephens; Eltham Cottage, Sept. 28th, 1846.*

Occurrence of Vanessa Antiopa in the Isle of Wight.—A friend of mine, Mr. R. Davis, informed me that he chased a *Vanessa Antiopa* near Sea View, about two miles east of Ryde, Isle of Wight.—*W. F. Evans; Admiralty, Whitehall, September 30th, 1846.*

Occurrence of Vanessa Antiopa at Limehouse.—Two specimens of this rare butterfly have come under my notice; one captured by Mr. G. Robertson on the 3rd of September, in the West India Docks, the other in a meadow close to my own residence.—*William Hindley; 3, Park Row, Rhoad's Well Road, Limehouse, September 29th, 1846.*

Occurrence of Vanessa Antiopa at Mickleham.—Mr. Joseph Standish put his net over a specimen of this butterfly at Mickleham, but did not succeed in securing it.—*J. W. Douglas; Grenville Terrace, Coburg Road, Kent Road, October 3rd, 1846.*

Occurrence of Vanessa Antiopa near Nottingham.—An unentomological shoemaker

has taken a specimen of the Camberwell Beauty this autumn at Southwell. I possess one taken some years ago near Nottingham.—*John Wolley ; Beeston, near Nottingham, October 3rd, 1846.*

Occurrence of Vanessa Antiopa at Saffron Walden.—A specimen of this butterfly was captured about six weeks ago in the parish of Saffron Walden.—*George Stacey Gibson ; Saffron Walden, October 9th, 1846.*

Occurrence of Vanessa Antiopa near Norwich.—Specimens of this butterfly have been taken, and others seen resorting to the blossoms of the ivy in company with *Vanessa Atalanta*.—*Charles Muskett ; Norwich, October 9th, 1846.*

Occurrence of Acherontia Atropos in Norfolk.—This insect has occurred plentifully this season in the county.—*Charles Muskett ; Norwich, October 9th, 1846.*

Occurrence of Acherontia Atropos near the Land's End.—I have received four of the imago taken in this district ; April 18th one, August 7th one, September 8th one, and September 25th one. Also four larvæ, which have all buried themselves in my breeding pots, but have not yet emerged, and one pupa which was injured by the person who dug it up.—*William Noye ; St. Just, near Penwith, October 8th, 1846.*

Observation on Acherontia Atropos.—Three female specimens of *Acherontia Atropos*, which I raised from larvæ were destitute of eggs ; the abdomens were quite empty.—*Henry Doubleday ; Epping, October 5th, 1846.*

Occurrence of Acherontia Atropos near Bristol.—A fine female of *Acherontia Atropos* was taken on Sunday, October 4th, by a labourer near here ; it reached me this afternoon uninjured, and is now on my setting-board.—*John Sircom, Jun. ; Brislington, October 6th, 1846.*

Occurrence of Acherontia Atropos at Chelmsford.—I have had brought me between the 1st of August and the present time (October 6th) eleven larvæ, fifteen pupæ, and three perfect insects of this species, and other persons in the neighbourhood who are known as collectors have obtained some of them. My caterpillars have all retired beneath the earth, but two which are still feeding ; none of these have yet produced the imago. Of the chrysalides, four have died, three I have still left, and the moths have made their appearance out of the rest, but only three are perfect specimens, the remainder having their wings more or less unexpanded. One also of the moths I had brought me was a cripple, proving they sometimes appear not properly developed when in their natural state. This insect seems irregular in its times of appearance ; I saw one alive this year in May. A person here has bred one in July, which I believe Moses Harris mentions as the usual time. At Hythe, in August, I received two alive, one taken, the other bred, while mine above-mentioned and those of other persons around here, have been coming out during the greater part of September, the end of which month and the beginning of October is the period assigned in most of the books I have seen. The males have been of more frequent occurrence than the females.—*Alfred Greenwood ; Chelmsford, October 6th, 1846.*

Observation on the occurrence and season of Acherontia Atropos.—The larvæ of this moth have been very abundant this season in all parts of England. Mr. Noye (Zool. 1345) seems surprised at finding a specimen of the perfect insect in April, and wishes to know whether it is common for them to be taken as early. I beg to inform him that they occur early as well as late. A great number of the pupæ, and these mostly females lay in that state throughout the winter. Other individuals pass the winter in the perfect state, depositing their eggs in the spring.—*H. J. Harding ; 1, York Street, Church Street, Shoreditch.*

Occurrence of Acherontia Atropos at Cambridge.—Caterpillars at Cambridge, feeding on what is there called the “tea-tree,” full-grown at the end of July; one in a very warm situation became a perfect insect by the middle of September. A perfect insect was also caught near Cambridge in the early part of the year. I mention these, because of the times of appearance, which, to my very limited experience, seems unusual.—*John Wolley; Beeston, near Nottingham, October 3rd, 1846.*

Occurrence of Acherontia Atropos at Chipping Norton.—A very fine specimen of this great insect flew into a grocer’s shop in this town, about eight o’clock in the evening of September 24th, probably attracted by the sweets the place contained; it was soon captured, and is in nearly a perfect state, and appears to have but a short time previously emerged from the chrysalis. I had several larvæ of this insect, all of which went into the earth between the 26th of July and 1st of August. Since which time, two chrysalides have been dug up in the potato fields. I examine my boxes frequently with the hope of finding them risen again.—*T. Goatley; Chipping Norton, Oxon, October 3rd, 1846.*

Occurrence of the larvæ of Acherontia Atropos near Cambridge.—A considerable number of the larvæ of *Acherontia Atropos* were found in the vicinity of the town, in July, feeding upon the common tea-tree, potato, &c. As far as I have been able to ascertain, not less than thirty-four were found. Those I had I reared (dating from the pupa) in less than twenty-one days, by placing them between the folds of flannel, and subjecting them to a moderate degree of heat.—*T. Brown; 15, Bridge Street, October 3rd, 1846.*

Occurrence of Acherontia Atropos near Leicester.—The remarkable commonness of this species in the vicinity of Leicester this year, is very difficult to account for. About the 20th of last July, and up to the middle of August, the larva appeared simultaneously in great numbers at different villages, on a common garden shrub called the tea-tree, upon which they thrived when unmolested; and when bred in confinement, all the specimens seemed healthy when changing to the chrysalis state. The circumstance of so many large larvæ appearing, attracted the attention of people otherwise but little interested in Entomology; but whose interest, however, was mainly directed to the disposal of the specimens for a pecuniary consideration. The only recorded instances of this moth being captured in this county, before the present, are two taken by myself in 1840, and one by a friend in 1842.—*John Plant; Leicester, September 28th, 1846.*

Occurrence of Acherontia Atropos near Hesse-upon-Humber.—I have to record the capture of five caterpillars of *Acherontia Atropos*, by some labourers whilst digging potatoes near this place.—*George Burton, Jun.; Hesse-upon-Humber, September 9th, 1846.*

On the occurrence of the larvæ of the Death’s-head Hawk-moth at Clonmel.—For some weeks back the caterpillars of the death’s-head hawk-moth have been found in this immediate neighbourhood in considerable numbers. About twenty have come into my possession, having been got in the potato grounds about here, and have probably been discovered much easier on account of the disease of the stalks of this plant than they would have been, had not such been the case. I have not known an instance before of the occurrence of this insect here in this stage, a few have been got in the perfect state.—*Robert Davis, Jun.; Clonmel.*

Capture of the larvæ of Acherontia Atropos near Morpeth, Northumberland.—The following paragraph appeared in the ‘Newcastle Journal’ of the 3rd of August:

"One of those rare and beautiful insects, the Sphinx Atropos, or death's-head moth, was found a few days ago in its caterpillar state, in the garden of Dr. Trotter, at Morpeth. It is about four inches in length, and one and a half inches in circumference, of a bright green colour, intersected with bands of light yellow. On emerging from its chrysalis, it becomes a moth, the largest and most beautiful of its kind, exhibiting on the top of the thorax the singular appearance of a skull or death's-head. There has none been seen since the warm summer of 1826.* It is generally found among potato plants, on the tops of which it feeds." To ascertain the correctness of this, I wrote to a friend, and had the following answer: "Dr. Trotter's Sphinx Atropos went into the pupa state on the 30th of July; length six inches, circumference two inches and three quarters, in the caterpillar. Mr. March has ten caterpillars, in chrysalis; Mr. Fenwick has twenty-five; Mr. Carse has a very large one, and is feeding it upon potato tops; and there are several more in the town. *Morpeth, Thursday, August 13th, 1846.*" This, he kindly accompanied by one of the caterpillars, of something like four inches in length, and which took the earth the day after I received it. G. Wailes, Esq. has received a caterpillar from Stanington, a village four miles south of Morpeth.—*Thomas John Bold; 42, Bigg Market, Newcastle-upon-Tyne, August 17th, 1846.*

Occurrence of Sphinx Convolvuli at Camberwell and near Faversham.—One specimen found on the 2nd of September, in a garden at Camberwell, was brought to me in the evening of that day. Seven other specimens were taken in June last by a friend, (Mr. Griffith), near Faversham, Kent, by nothing.—*J. F. Stephens; Eltham Cottage, Brixton.*

Occurrence of Sphinx Convolvuli at Clonmel and Dunmore.—Within about two weeks I have met with two specimens of Sphinx Convolvuli here, and as many more at Dunmore (county Waterford), I have seen some more which were not captured. One of the former, which, I myself caught, was hovering about a woodbine in front of a cottage there, and several more were seen in similar places.—*Robert Davis, Jun.; Clonmel.*

Occurrence of Sphinx Convolvuli near Norwich.—Upwards of fifty fine specimens of the Sphinx Convolvuli have been captured at Harleston, in this county during the warm evenings, near the end of August last; though an insect of daring and rapid flight, they were taken without difficulty whilst hovering about a large honeysuckle.—*Charles Muskett; Norwich, September 18th, 1846.*

Occurrence of Sphinx Convolvuli near Epping.—About the middle of August a number of specimens of this insect made their appearance in this neighbourhood. I captured upwards of forty over three or four Petunias. The greater portion of them were more or less worn when I first observed them; and not a single female had any eggs in the abdomen, not even those which were tolerably perfect. It is very singular that this species should have appeared in such profusion all over the kingdom, and yet no larvæ were observed by any one, so far as known.—*Henry Doubleday; Epping, September 20th, 1846.*

Occurrence of Sphinx Convolvuli at Cambridge.—Upwards of sixty specimens of the Sphinx Convolvuli have been taken by the collectors in the town and neighbourhood, from about the 16th of August up to the middle of September, chiefly by sweet-

* The writer of this, (most probably not an entomologist) is in error here, as the recorded and other instances of its capture will testify.—*T. J. B.*

ening the few remaining flowers of the jasmine and honeysuckle. The unprecedented number, led some to suppose that they were visitors from the Continent, but the fine condition of some of those captured, precludes the possibility of travelling such a distance. It is also worthy of remark, that most of them were taken late in the evening.—*T. Brown* ; 15, *Bridge Street, Cambridge, September 21st, 1846.*

Occurrence of Sphinx Convolvuli near York.—Several specimens of the *Convolvulus hawkmoth (Sphinx Convolvuli)* have within the last three weeks, been seen and taken in and near York, they seemed to be partial to the flowers of *Petunias*, although a male in fine condition, I took on Saturday evening, was hovering over the flowers of the snapdragon.—*Robert Cook* ; *Collier Gate, York, September 14th, 1846.*

Occurrence of Sphinx Convolvuli near Kingsbury, Middlesex.—Three specimens of *Sphinx Convolvuli*, two males and one female, have been captured here, and are now in my possession ; the first was taken on Sunday, August 9th, the second August 16th, by myself, and the last on August 20th ; they were all taken in a large conservatory belonging to my friend *W. Greateorex, Esq.* —*Fred. Bond* ; *Kingsbury, August 21st, 1846.*

Capture of Sphinx Convolvuli near Winchester.—About a fortnight ago I had a fine specimen of *Sphinx Convolvuli* brought to me, which had been found in a garden in this city.—*Henry Shepherd* ; *North Walls, Winchester, September 8th, 1846.*

Occurrence of Sphinx Convolvuli in City Road, London.—A specimen of the above-named moth was captured in a yard in Old Street, City Road, by a woman, who brought it to me.—*Thomas Hall* ; 7, *City Road, August 24th, 1846.*

Occurrence of Sphinx Convolvuli near Tonbridge Wells.—Seven specimens of *Sphinx Convolvuli* have been captured in this neighbourhood within the last fortnight.—*Walter R. Reeves* ; 14, *Parade, Tonbridge Wells, September 14th, 1846.*

On the occurrence of Sphinx Convolvuli at Sudbury.—On the 3rd instant I was informed by *G. W. Fulcher, Esq.*, of Sudbury, that a large moth, which he mistook for the Privet Sphinx, had been rather plentiful in his garden during the last fortnight round the flowers of the linear-leaved evening primrose (*Ænothera linearis*), sometimes several appearing in the course of an evening, and in two instances he had seen two round the same plant at a time: thinking that *Mr. Fulcher* might be mistaken in the species, I obtained permission to visit his garden in the evening, and soon had the pleasure of seeing a *Sphinx Convolvuli* hovering over a blossom of the *Ænothera*, but it escaped my over-anxious endeavours to take it. On the evening of the 4th, I saw another which also made its escape. On the 5th I captured three males, one of them very much shattered, but the others in fair condition. 6th, saw one in my own garden at Ballingdon, it approached the honeysuckle, but did not stay to feed. 7th, finding that *Mr. Fulcher's* plants had been removed, I obtained access to a garden at Ballingdon, in which were several plants of the common evening primrose (*Ænothera biennis*), in full bloom, from which I took a specimen of the Sphinx, but a piece of the plant prevented my closing the net and allowed it to escape, this is the last I have seen. This Sphinx makes its appearance early in the evening, as soon as it begins to be twilight, and retires before it gets dark ; it does not alight on the plant, its long trunk enabling it to feed at the distance of three inches from the blossom, and when so engaged is easily approached, as *Mr Fulcher* informs me that he captured a fine pair with his hat on the 20th of August, which he presented to a lady of Sudbury ; one of which visited some honeysuckles which he held in his left hand, and allowed him to take it in his hat with the other ; he also took one on the 29th ult., which (not thinking

it of any value) he set at liberty on the following morning. About the same time a specimen was taken by a young gentleman in the street, flying very low in the middle of the day; this I have seen, it is a very dark male, but is completely spoiled by being confined in a small box. The female in my cabinet was taken about a mile from Sudbury in 1842.—*W. Gaze; Ballingdon, Sudbury, Suffolk, September 14th, 1846.*

Occurrence of Sphinx Convolvuli at Aylsham.—A specimen of the *Sphinx Convolvuli* was taken at Swaffham, in this county, last week and given to a friend of mine, in whose possession I saw it.—*H. T. Frere; Aylsham, September 14th, 1846.*

Occurrence of Sphinx Convolvuli in Yorkshire.—No less than ten specimens of this insect have fallen into the hands of the Rev. Francis Orpen Morris, of Nafferton Vicarage, near Driffield. This gentleman has sent me a very long and interesting description of their capture: the insect appears to be particularly fond of the blossom of *Phlox grandiflora*.—*E. N.*

Occurrence of Sphinx Convolvuli near Hessle-upon-Humber.—I must beg you to do me the favour to insert into the pages of your highly interesting periodical an account of the capture of the *Sphinx Convolvuli*, in numbers, which I believe to be unparelled. The first occasion on which I met with this insect was, I think, on the evening of August the 24th, feeding upon some honeysuckle, which was then in full flower. I made an instant attack upon them with my net, and succeeded in capturing two the same evening. From that time to September 4th, I have generally taken one, and sometimes two, every day. I have captured in all, twelve specimens, the majority, I am sorry to say are much injured, but I am possessed of four which are in excellent condition.—*G. Burton, Jun.; Hessle-upon-Humber, Yorkshire, Sept. 9th, 1846.*

Occurrence of Sphinx Convolvuli near Leicester.—This species may henceforward be written down as common, in the neighbourhood of Leicester, as from the end of July to the beginning of October, there have been numbers observed flying about in the evening, and above twelve specimens have been captured; none of these, however, in very fine condition, from the difficulty of preventing them committing suicide by reckless endeavours to escape.—*John Plant; Leicester, September 28th, 1846.*

Occurrence of Sphinx Convolvuli at Blackheath.—Having seen in the 'Zoologist' some notices of capture of *Convolvulus Hawk-moths* in the neighbourhood of London, I am induced to believe that the following record of their great abundance at Blackheath during the present season, may not be uninteresting. In the last week in August in the present year, several specimens of this beautiful moth were observed at dusk, hovering upon the wing round some very fine plants of *Marvel of Peru* (then in full bloom); and inserting their long trunks into the tubular flowers of these beautiful plants. Whilst thus employed, the quick motion of their wings, and the rapidity with which the insects shifted their positions from place to place over the bushy bed of flowers, rendered it not only impossible to distinguish their colour or outline, but extremely difficult to effect their capture. The whirr of the wings of this agile insect, is distinctly audible, and the gracefulness of its motions, highly pleasing; hanging for an instant in the air before the flowers, then taking a long and elegant sweep to some distance, and again returning to its flowery feast. Between the period above-mentioned, and the 11th of September, no fewer than twenty-nine specimens were taken at the same clump of plants. They were all quite fresh and of great beauty, but their great strength, and active exertions to escape when in the net, added to the deficiency of light, render it extremely difficult to secure them without partial injury. Their feed-

ing time, appears to be very short; the first specimens, not approaching the flowers until quite at dusk, and all deserting the plants in about ten, or at the utmost fifteen minutes. For greater certainty upon this point, after the darkness became too great, to allow them to be seen with any certainty, a lantern was upon two or three occasions, placed at a sufficient distance from the plants, to have enabled any new comers to be seen, without producing sufficient light upon and about their feeding ground, to scare them away: but after the near approach of darkness, they appeared to have wholly abandoned their feeding. They may perhaps again resort to the flowers at twilight in the morning, but whether such be the fact, or not, I did not attempt to ascertain. The bee hawk-moth feeds twice in the day, at ten in the morning, and again between three and four o'clock in the afternoon. Had the plants been visited every evening, (which was not the case) I have no doubt that double the above-mentioned number might have been taken. From the fact that (within my own knowledge) this scarce moth has during the present season appeared in several localities widely distant from each other, I am induced to believe that its occurrence must have been unusually general. In the last week in August, I took a male specimen at Ventnor, in the Isle of Wight; at about the same period a specimen was taken at Hastings; and three were captured at about the same time, by a young entomological friend at Worthing. I have a beautiful female specimen of this moth, which was taken in my own garden at Blackheath, in *perfect condition*, on the 4th of June, 1832. — *N. B. Engleheart; Blackheath, September 24th, 1846.*

Occurrence of Sphinx Convolvuli at Leyton, Essex.—During the first week of last September, four specimens of the Sphinx Convolvuli, (the Convolvulus hawk-moth) attracted by the light into a conservatory adjoining the house, were captured at Knott's Green, Leyton, Essex.—*J. Gurney Barclay; Walthamstow, Oct. 3rd, 1846.*

Occurrence of Sphinx Convolvuli near Yarmouth.—A large number of this moth have been taken near Yarmouth this autumn. — *George Fitt; Yarmouth, October 6th, 1846.*

Occurrence of Sphinx Convolvuli near Redcar.—Two specimens of Sphinx Convolvuli have occurred at Redcar this autumn. — *T. S. Rudd; Redcar, October 5th, 1846.*

Occurrence of Sphinx Convolvuli at Hackney.—This rare insect has made its appearance rather abundantly this season in the neighbourhood of Hackney; upwards of twenty specimens have been taken, most of them I am sorry to say, by persons not acquainted with entomology.—*H. J. Harding; 1, York Street, Church Street, Shoreditch, October 6th, 1846.*

Occurrence of Sphinx Convolvuli near Uppingham.—Among other places, Uppingham may be recorded as one where Sphinx Convolvuli has appeared this summer. Two were taken on the 19th of August, and one a few days afterwards. I myself saw a fourth (on the wing): and from the descriptions I have heard, there seems little doubt that several more were seen. — *William Turner; Uppingham, October 6th, 1846.*

Occurrence of Sphinx Convolvuli at Brislington.—A female specimen of this Sphinx was captured here on the window frame of a hot-house; it was in fair condition.—*J. Sircom, Jun., Brislington, October 1st, 1846.*

Occurrence of Sphinx Convolvuli at Chipping Norton.—A specimen was brought to me early in September, by a person who found it settled on some wearing apparel left out to dry, bringing it a distance of three miles wrapped in paper, which considerably

injured it. Since which time, two others have been found at this place; one of which was found by a lad, who carried it nearly all the day alive in his pocket, by which it is greatly injured.—*Thomas Goatley; Chipping Norton.*

Occurrence of Sphinx Convolvuli and Acherontia Atropos near Hull.—*Sphinx Convolvuli* has occurred at Thorngumbald, about six miles from here, in considerable numbers, a collector having taken six or seven specimens with his net as they were flying round the flowers of the honeysuckle. This insect, to the best of my knowledge, has not been noticed here previously. The same person had several larvæ of *Acherontia Atropos*, which were found towards the latter end of July feeding on the [tea-tree or] boxthorn (*Lycium europæum*). They changed soon after, and the moths emerged in August. The larvæ, were in several localities quite common, particularly in the north of Lincolnshire, about Brigg; they were found chiefly on the boxthorn, sweet-pea, jasmine, ash, and other plants; seldom on the potato, which is mostly destroyed by the prevailing disease.—*G. W. Norman; Hull, October 7th, 1846.*

Occurrence of Sphinx Convolvuli near Nottingham.—A specimen at Beeston, near Nottingham, in the middle of September, and several others near Newark. I have not seen more than half a dozen specimens taken in all previous years in this neighbourhood.—*John Wolley; Beeston, near Nottingham, October 3rd, 1846.*

Occurrence of Sphinx Convolvuli at Hythe, Kent, and at Chelmsford, Essex.—I obtained at Hythe, in Kent, between the middle of August and the 4th of September last, thirty specimens of this insect, seventeen males and thirteen females. Of these, I took twenty-three hovering over a honeysuckle, in a little yard adjoining my lodgings, where I mostly caught two each night. They did not seem to confine their period of flight to dusk, but often made their appearance late in the evening, and I took several at nine o'clock, when it was quite as dark as it would have been. The other seven were brought to me, having been found at rest, on palings, &c. A few of the specimens were fine, but the greater part more or less worn, the females generally rather better than the males. Since my return to Chelmsford, I have obtained two more, one of which, a male, caught on the 1st of October, was in good condition, whereas those I took last, a month previously, were mostly broken. I took a fine pair of *S. Convolvuli* in my garden in 1842, since which, I have not seen the insect alive till the present year.—*Alfred Greenwood; Chelmsford, October 6th, 1846.*

Occurrence of Sphinx Convolvuli and Acherontia Atropos at Tooting.—*Sphinx Convolvuli* has appeared rather plentiful this season in the neighbourhood of London, upwards of twenty-four specimens have been taken in the nursery of Messrs. Rollissons, of Tooting, they were taken at twilight, extracting honey from the flowers of *Lilium lancifolium*, and varieties. I have also to record the appearance of *Acherontia Atropos* near the same locality; it was taken in the chrysalis state by Mr. Curtis, of Balham, and by him kindly presented to me.—*C. Wood; Balham, October 5th, 1846.*

Occurrence of Sphinx Convolvuli near Faversham.—This evening I have seen quite a swarm of *Sphinx Convolvuli* over my *Petunia* and *Verbena* beds, at least a dozen, if not more: the females appear much more abundant than the males.—*F. W. Horsley; Dunkirk Parsonage, near Faversham, August 18th, 1846.* I have observed this insect in greater or less abundance for the last six weeks: I have frequently had two, and on one occasion, three specimens, in my net at once.—*October 6th, 1846.*

Occurrence of Sphinx Convolvuli near the Land's End.—Upwards of twenty specimens of this fine species have been taken here, the greater number of which have fallen to my lot, but many of them were much dilapidated. They were captured from Au-

gust 5th to September 25th. My friend, Mr. George Fox, of Rose Vale Nursery, Penzance, captured several hovering over the evening primroses, and Marvel-of-Peru, which he kindly presented to me.—*William Noye ; St. Just, near Penwith, October 8th, 1846.*

Note on Sphinx Ligustri.—On the 29th of May I bred a specimen of *Sphinx Ligustri*, a female, which had remained two years in chrysalis, I having reared it myself from eggs procured in 1844, (the remainder of the brood duly arrived at maturity in June, 1845) and on June 2nd, another specimen appeared, which I had kept two years in pupa. I have frequently had this insect remain two years in chrysalis, indeed I have a specimen now, captured last autumn, which, having passed by the usual season of appearing, will probably remain in chrysalis till next year. I also bred a specimen on June 2nd, which did not change to pupa till the 2nd of December last. I never before heard of the larva living till so late in the year.—*P. H. Vaughan ; Redland, near Bristol.*

Occurrence of Sphinx Nerii near Hamburg.—Twenty specimens of the larva of this *Sphinx* were found at the latter end of last month (August) in the botanical garden belonging to Mr. Rootsh at Flottbeck. All of them have changed into pupæ, and some will soon appear in the perfect state, as the eyes and antennæ are very distinctly visible. About twenty years ago a single specimen of this *Sphinx* was taken at Burscheid, on the Rhine, but this is the first instance of its occurrence so far north.—*A. Lamek ; Wandsbeck, near Hamburg, September 18th, 1846.*

Occurrence of Deilephila Galii at Lewes.—A specimen was found at Lewes in June last, by Mr. Weir's uncle.—*J. F. Stephens ; Eltham Cottage, Brixton.*

Occurrence of Deilephila Galii near Faversham.—I may mention that I have captured a specimen of *Deilephila Galii*, hovering over the blossoms of *Verbena* in my garden.—*T. W. Horsley ; Dunkirk Parsonage, near Faversham, Kent, October 6th, 1846.*

Occurrence of Deilephila Livornica near Lewes.—A pair was found in June last, near Lewes, Sussex, by some boys, and given to Mr. Weir.—*J. F. Stephens ; Eltham Cottage, Brixton.*

Occurrence of Deilephila Livornica near the Land's End.—Two specimens of this scarce moth were taken about the middle of April ; one in a hay-loft at Penzance, and the other resting on moss under a tree at Pendarvis ; the latter I possess through the kindness of a friend.—*W. Noye ; St. Just, near Penwith, October 8th, 1846.*

Occurrence of Deilephila Livornica in London.—I captured a specimen of this rare moth in a garden in which fuchsias were growing ; it was at rest on a wall which divides the Old Bethnal Green Church-yard from the garden.—*J. Bramley ; 9, Winchester Street, Waterloo Town, Bethnal Green.*

Occurrence of Deilephila Celerio near Leicester.—An immaculate specimen of this rare moth was caught on the 24th of September, apparently just escaped from the chrysalis in a garden on the outskirts of Leicester.—*John Plant ; Leicester, September 28th, 1846.*

Occurrence of Deilephila Celerio at Great Baddow, Essex.—A specimen of this fine moth was taken at the end of April last at Great Baddow, a village near this town, by a woman, who states she found it one morning on a mantel-piece in her cottage. The insect, which appears to be a female is now in my possession, but is somewhat worn through rough usage for a week before it was properly taken care of. At the end of August last a second example occurred in the larva state, which I believe I am

right in referring to this species. It was found in the town, feeding on the leaves of a vine, and is now in the pupa form, in the possession of a friend.—*A. Greenwood; Chelmsford, October 6th, 1846.*

Occurrence of Deilephila Celerio at Lewes.—I had a very handsome present from Mr. Potter, of Lewes, this morning, of a very fine specimen of *Deilephila Celerio*; his account of the capture is as follows: "Taken on grass in this town, under the sheltered part of a wall, and brought to me alive on the morning of September 30th." I think this locality may now be allowed to have furnished more rare Sphinges than any other this year; viz., *Acherontia Atropos*, *Sphinx Convolvuli*, *Deilephilæ Celerio*, *Livornica*, and *Porcellus*.—*J. Jenner Weir; 17, Grosvenor Park North, Camberwell, October 1st, 1846.*

Capture of Deilephila Celerio at Birmingham.—On the 13th of September, a specimen of this rare *Sphinx* was captured by Mr. Paul Dixon, resting on a window-shutter, in Hospital-street, Birmingham; it is now in my collection.—*Richard Weaver; Birmingham, October 9th, 1846.*

Capture of Trochilium Allantiforme (Newman, Ent. Mag. i. 74) *at Greenhithe, Kent.*—I have captured a fine male specimen of this rare insect near the same locality as that taken by Mr. Chant in 1839, viz. Greenhithe, in Kent: my specimen was beat from a whitethorn hedge in a lane near Greenhithe; it is the same, in every respect, as that figured in Wood's 'Index.'—*H. J. Harding; 1, York Street, Church Street, Shoreditch, October 6th, 1846.*

Occurrence of Lasiocampa Trifolii, near the Land's End.—I found seven larvæ of this rare species again this season, but only bred two; it is difficult to breed, the two which I bred were females, they came out on the 17th and 19th of August, having been in the pupa state about two months; those I bred last year did not appear till about the 24th of September.—*W. Noye; St. Just, Penwith, October 5th, 1846.*

Capture of Lithosia pulchella near Epping.—A fine specimen of this insect, apparently just out of the chrysalis, was picked up by a boy in a field near here on Saturday.—*Henry Doubleday; Epping, October 5th, 1846.*

Occurrence of Agrotis saucia at Hammersmith.—I had the pleasure of taking a male of this rare insect at sugar, at Hammersmith Marshes, on the 15th; it has never to my knowledge occurred there before; it settles down earlier than *suffusa*, and does not fold its wings in the same manner, but slightly raised more like *Segetum* often does.—*W. Wing.*

Occurrence of Graphiphora subrosea (Steph.) *at Whittlesea Mere.*—This insect was discovered by Mr. Weaver some years ago on the borders of Whittlesea Mere, and has occurred again this season; it seems to be unknown upon the continent, and is closely allied to several American species.—*Henry Doubleday; Epping, September 29th, 1846.*

Capture of Catocala Fraxini at Manchester.—This rare moth was taken at sugar, on the 12th of August, at Agecroft Bridge, near Kersal Moor; the captor, a young man just commencing collecting, was without pins or boxes, consequently the specimen is spoiled. Two others were taken in this district some years back; I possess one taken near Carrington Moss, the other was captured on the wing at Newton Heath, and was in the late Mr. Eveleigh's cabinet.—*Robert S. Edleston; September 8th, 1846.*

Capture of Catocala sponsa at Darenth Wood, Kent.—A fine specimen of this insect was taken with sugar at Darenth Wood in June: it is the first instance I have

known of this species being taken by this means. — *H. J. Harding* ; 1, *York Street, Church Street, Shoreditch, October 6th, 1846.*

Note on the capture of Emmelesia Blomeri at Chenies.—I was so fortunate as to catch, on the evenings of the 10th, 12th, 16th, and 19th of June last, five specimens of *Emmelesia Blomeri*, *Curtis*, *pulchraria* of *Duponchel*, and continental cabinets. With the exception of one, they are all in a tolerably fine and perfect condition. This rare and very local species, was confined entirely to a small, open space near the edge of a wood. A friend also, captured two or three additional specimens at the same place.—*I. Taylor, Jun. ; Stanford Rivers, Essex.*

Occurrence of Cynæda dentalis at Lewes.—A pair of this insect were captured by Mr. James B. Ellman, of Battle, on the morning of the 3rd of July last, whilst collecting in my company on the Cliff Hills, near Lewes. Both specimens are now in my collection, and are, I imagine, a portion of a first brood of the insect, as I have seen three more, in the possession of Mr. J. Jenner Weir, which were taken on the same ground about the middle of last month, and which, from their fine condition, favour the supposition, that the moth is double-brooded.—*W. Thomson, Jun. ; 6, Loudoun Place, North Brixton, October 7th, 1846.*

Occurrence of Peroneæ or Buttons in Hainault Forest.—I beg to hand you a list of *Peroneæ* captured by myself in Hainault Forest, between the 15th of August to the 27th of September ; I obtained them by beating the hawthorn and hornbeam, in shady places :—

<i>Peronea profanana</i>	<i>Peronea fulvovittana</i>
„ <i>semiustana</i>	„ <i>Bentleyana</i>
„ <i>striana</i>	„ <i>fulvostriana</i>
„ <i>substriana</i>	„ <i>cristalana</i>
„ <i>brunneana</i>	„ <i>subcristalana</i>
„ <i>spadiceana</i>	„ <i>subvittana</i>
„ <i>vittana</i>	„ <i>insulana</i>
„ <i>consimilana</i>	„ <i>cristana</i>
„ <i>Desfontainiana</i>	„ <i>Chantana</i>
„ <i>fulvocristana</i>	„ <i>alboflammana</i> .
„ <i>albovittana</i>	

William Hindley ; 3, Kirk's Row, Rhoad's Well Road, Limehouse, Sept. 29th, 1846.

Occurrence of Peroneæ or Buttons at Hainault Forest.—This pleasing and interesting genus has occurred rather plentifully this season at Hainault Forest : every known species has been taken, together with numerous varieties, which some few years back would have been made into new species. From the numerous varieties I have seen this season, connecting, as they certainly do, one species with another, I am certain that there are but three, or at most four species among the Button tribe. I have a number of duplicates that I should be most happy to exchange with any of my brothers of the net who may be in want of them.—*H. J. Harding ; 1, York Street, Church Street, Shoreditch.*

Occurrence of Macrocnema marcida near Yarm.—I beg to mention, as a proof of the advantage which your very useful ‘*Zoologist*’ confers, that on reading Mr. Wollaston’s observations on the occurrence of *Macrocnema marcida* on *Cakile maritima*, I searched that plant last week, and found the insect in numbers for the first time.—*G. T. Rudd ; Worsall Grange, Yarm, October 6th, 1846.*

Occurrence of Platyrhinus latirostris near Cheltenham.—I have lately captured several specimens of *Platyrhinus latirostris* under the bark of ash-trees in this neighbourhood, and on breaking open an old dried specimen of *Sphæria concentrica*, I found that it contained several of the larvæ.—*Charles Prentice*; 1, *Oxford Villas, Cheltenham*.

Occurrence of Notoxus monoceros near Norwich.—About sixty specimens of *Notoxus monoceros* have been taken in one locality near this city by my friend, Mr. Bridgeman.—*Charles Muskett*; *Norwich, September 20th, 1846*.

Capture of Nebria livida at Bridlington.—During a late excursion on the Yorkshire coast, I had the satisfaction of taking several specimens of this interesting insect. It occurs in tolerable abundance in the mud cliffs to the south of Bridlington Quay, where it may be found by splitting open the crevices (formed by the sun's heat) facing the sea. I generally found them adhering close together, about three or four at a time. Although exceedingly active, they are much easier to catch than the other species, *complanata*, which is remarkably difficult to obtain, even when seen, so quickly does it run and elude the grasp. It also differs from *livida* in its habitat. The latter species is found *only* in the cliffs, and usually several feet above high-water mark; whereas *complanata* I have never observed except on the *beach* itself, generally under logs of wood, stones, or rejectamenta, but never in situations similar to those selected by *livida*.—*T. Vernon Wollaston*; *Jesus College, Cambridge, September 17th, 1846*.

Capture of Tapinotus sellatus.—It is with great pleasure that I record the capture of this very interesting little Curculio. Happening to be collecting at Whittlesea Mere at the beginning of last June, I swept into my net what I believed at the time to be a large and beautiful species of *Poöphagus*; but which, on further examination, proved to be the true *Tapinotus sellatus* of Fabricius. The only known indigenous example was, I believe, in the possession of Mr. Curtis, and is said (I am told by Mr. Walton) to have been taken in Suffolk. In Sweden it appears to be not uncommon, where it is found on the *Lysimachia thyrsiflora*, but, although I worked the locality at Whittlesea Mere for two entire days, I could not obtain another specimen, nor did I observe the plant just mentioned growing anywhere in the neighbourhood.—*T. Vernon Wollaston*; *Jesus College, Cambridge, October 6th, 1846*.

Description of a new species of Haltica.—*Haltica dispar*. n. s. § A. Deep black, with a bluish tinge, without any metallic lustre, one line long. *Antennæ of male*.—First joint elongate and stout; second very short; third and sixth short, conic, about equal in length; third closely attached to the fourth; fourth and fifth much incrassated, much larger than the third or sixth, not compressed; seventh and following much more elongate and stouter than the sixth, but not flattened; black and pubescent. *Antennæ of female*.—First joint as in the male; second, third, and fourth joints elongate conic, more elongate than the third or sixth of the male; fifth very little longer than the fourth or sixth; sixth and following elongate, not compressed; black, with three or four basal joints pitchy red, pubescent. *Head, thorax, and elytra* rather coarsely and thickly punctured; elytra obtuse at the apex, flattened in the male, more convex in the female, shining deep black, with a bluish shade; without any metallic tinge on head, thorax, or elytra; legs, as the body, with the knees pitchy. Taken by me in the neighbourhood of Ryde, May, 1838. *Obs.* This species differs from its nearest ally, *consobrina*, in the structure of the antennæ, especially of the female; the sixth joint not being small, but somewhat elongate, and the fifth not being much, if anything,

longer than either the fourth or sixth, which are nearly of equal length. (Zool. 1239). As I have not been able to find that the insect has been previously noticed or described, I have assumed it to be a new species, and have named it "dispar."—*G. T. Rudd*; *Worsall Grange, Yarm, October 7th, 1846.*

Discrepancy between the two antennæ of a Dytiscus.—A short time since, I took a male specimen of *Dytiscus punctulatus* in a pond on Wimbledon Common, with one antenna considerably shorter than the other, so much so, that I thought at first it was damaged; the number of articulations are however complete in both, and as far as the fifth joint of equal size, but from that joint they diminish rapidly in the left antenna, the four terminal joints of which are only equal to the two last of the other: the total length may be about two-thirds. In the Crustacea, such differences are frequent, and accounted for, on the supposition of their limbs having been lost and reproduced, but as no true insect has been hitherto discovered to possess this power of issuing second editions of lost arms and legs, what can be the cause of a similar one-sided variation in them?—*George Guyon*; *Richmond, Surrey, September 11th, 1846.*

Occurrence of the Locust near Knaresborough.—Last Wednesday, a person brought me a specimen of the locust, which had been taken in a barley-field, about eight miles from this place.—*James C. Garth*; *Knaresborough, August 28th, 1846.*

Capture of the Locust on Peckham Rye.—I yesterday caught a very perfect male specimen of the migratory locust on Peckham Rye; it took very short flights of only a few yards at a time, and was easily overtaken.—*Bevington Newman*; *2, Hanover Street, Peckham, September 1st, 1846.*

Occurrence of the Locust in Hyde Park.—Yesterday a person brought to the Museum a specimen of *Locusta migratoria*, which he had taken the day before in Hyde Park.—*Adam White*; *British Museum, September 2nd, 1846.*

Occurrence of the Locust at Kingsbury, Middlesex.—While shooting on the 2nd at Kingsbury, I observed something moving about a meadow in a curious manner, and on going up to the spot, I saw what I at first took for a large Sphinx, but on catching it, it proved to be a fine specimen of *Locusta Christii* (*Curtis*); on reaching home with my prize, I was very much surprised to find that another had been left for me, that was taken near Stanmore Marsh, in a pea-field, two or three days ago.—*F. Bond*; *Kingsbury, Middlesex, September 3rd, 1846.*

Note on the occurrence of the Locust in Yorkshire and Devonshire.—Several specimens of this interesting insect, captured during the recent hot weather on the coast of Yorkshire, have lately come beneath my notice. Happening to be at Bridlington in August, I had the opportunity of obtaining a fine specimen, which was taken on Flamborough Head, at the beginning of the month. Mr. Strickland also tells me that two have been brought to him since I left, captured at Bridlington, he thinks, on or about the 28th. I am informed by Professor Balfour, of Glasgow, that, during a recent excursion in the west, he saw a specimen which was taken a few weeks ago at Dawlish, on the coast of Devonshire. Considering the many other instances in which I hear it has occurred, I was at first inclined to attribute the appearance of this insect to the unusual hotness of the season. This, however, can scarcely be the case, for at the late meeting of the British Association at Southampton, Mr. Strickland informed me that more specimens occurred on the coast of Yorkshire last year than this, which, it will be remembered, was a particularly cold and wet season. One of these he has still in his possession, but the rest have been distributed amongst his friends. I have not heard

that any other species except migratoria have been taken. — *T. Vernon Wollaston*; *Jesus College, Cambridge, September 13th, 1846.*

Occurrence of the Locust at Camberwell.—A specimen of the locust was taken within a quarter of a mile of this house yesterday, 16th of September, 1846. — *J. F. Stephens*; *Eltham Cottage, Brixton, September 17th, 1846.*

Occurrence of the Locust near London.—I send you a specimen of the locust, captured this morning at Walthamstow; a second was taken in Copenhagen Fields, near Islington, on the 16th; and a third near Highgate, which has just been brought to me. — *Thomas Hall*; 7, *City Road, September 18th, 1846.*

Occurrence of the Locust near Epping.—A female of this species was caught in a corn-field in the early part of the present month. — *Henry Doubleday*; *Epping, September 20th, 1846.*

Occurrence of the Locust near York.—A specimen of this insect was found alive in this city a few weeks back, and since then eleven others have been (to my knowledge) captured in and near York. I had two specimens brought to me alive during the past week, one of which was taken on the 14th inst., by some boys in the Cattle Market, close by the city walls, after rather an amusing chase among the sheep-pens; this I have killed and set: the other is still alive, and eats, but very seldom, of some grass, put under the glass along with it; this was captured near the village of Shipton, upon the Great North Road, about five miles from York. — *Robert Cook*; 30, *Collierygate, York, September 21st, 1846.*

Occurrence of the Locust in Cornwall.—On the 15th instant, a man brought me a living specimen of *Locusta migratoria*, which he caught on the cliffs here; and I have since received another, taken at Penzance. — *William Noye*; *St. Just, Penwith, September 22nd, 1846.*

Occurrence of the Locust near Richmond, Surrey.—Last week I received a specimen of the locust, captured the preceding week near Richmond, Surrey. — *J. F. Stephens*; *Eltham Cottage, September 28th, 1846.*

Occurrence of the Locust near Leicester.—A pair of locusts were captured in a barley-field, near the Old Abbey, by Mr. Robert Warner, in the first week in September: the male measures $4\frac{3}{4}$ inches from the tip of one wing to the other, and $2\frac{3}{4}$ inches in the body, which is of a brownish green; the upper pair of wings are spotted over with similar coloured markings, and the under pair are delicate green. I have received from several correspondents, accounts of the capture of locusts, one by a lady at Skeffington, and others from various villages in Leicestershire, proving, that its range is more extensive than usual, and that the summer heat has developed the species in great abundance. — *John Plant*; *Leicester, September 28th, 1846.*

Occurrence of the Locust at Camberwell.—On the 16th of August I had a very fine specimen brought me by a gardener, who caught it on cabbages in Cold Harbour Lane, Camberwell; and on the 29th of September I received a second specimen from the same locality. — *J. Jenner Weir*; 17, *Grosvenor Park North, Camberwell, September 30th, 1846.*

Occurrence of the Locust near Worcester.—A specimen of this destroying insect was taken on a marygold in a small garden at the back of one of the houses in Broadstreet, in the city of Worcester, on the 13th of September; it was presented to the Museum alive, and is now in the course of drying, to be added to this already very interesting collection. Another specimen was taken the same day in front of St. Cle-

ment's Church, on the western side of Worcester. Two or three other specimens have been taken in the vicinity.—*George Reece ; Worcester, October 3rd, 1846.*

Occurrence of the Locust near Nottingham.—A lady, whose entomological knowledge and extensive travels, make it probable she is not mistaken, assures me she has lately seen *Locusta migratoria* in her own garden at Lenton, near Nottingham.—*J. Wolley ; Beeston, near Nottingham, October 3rd, 1846.*

Occurrence of the Locust near Redcar.—Seven specimens of the locust were taken during the past September near this place.—*T. S. Rudd ; Redcar, October 5th, 1846.*

Occurrence of the Locust near Uppingham.—Towards the end of August, an example of the locust tribe was taken alive at Preston, a village about two miles from Uppingham. The following unscientific account, will perhaps, determine the species :—expansion of the upper wings, which were pale brown, rather faintly marked in a somewhat tessellated manner with darker brown, $4\frac{3}{4}$ inches ; length of the body, which with the head and thorax, were dark brown, 2 inches ; lower wings paler than the upper ones, shading into a greenish yellow towards the anal angle, near their tips were two dashes of darker brown. When the insect was alive, the belly and lower part of the body were tinged with rosy.—*William Turner ; Uppingham, Oct. 6th, 1846.*

Occurrence of the Locust near Chelmsford.—A week or two ago I took a locust in the streets of Chelmsford, and a friend of mine has taken another, but I do not know what species to refer them to.—*Alfred Greenwood ; Chelmsford, October 6th, 1846.*

Occurrence of the Locust near London.—Several specimens of this foreign insect have made their appearance in several parts of London, no doubt attracted by the mildness of the season.—*H. J. Harding ; 1, York Street, Church Street, Shore-ditch, October 6th, 1846.*

Occurrence of Locusts in the North of England.—We have, in common with other localities, been visited by an extraordinary number of locusts. The following paragraph appeared in the 'Newcastle Journal,' of August 15th, 1846. "A large flight of locusts passed over Sunderland on Monday evening last ; they hovered over the neighbourhood of Hendon, and numbers alighted on the hedges there ; till on a crowd beginning to collect they took flight towards the south. They appeared to conduct their migration in close company. Several of them were caught." I have made many enquiries with regard to this "flight," but without being able to ascertain more than that a great many locusts have been taken in the locality indicated (Sunderland), where many people have them now alive as curiosities. This also is part of an extract from the above paper of the same date. "A specimen of that destructive insect, the locust (*Gryllus migratorius*), was caught this week in the streets of this town, and another was taken at Marsden, both of which are in the Museum of the Natural History Society." This is quite correct, and since then I have seen and heard of several others having been taken in the town and neighbourhood. On their last field-day (September 11th), some members of the "Tyne-side Naturalist's Club" chased a specimen without success, on the sea-coast near Marsden ; and on Friday last (October 2nd), I had a living specimen brought me, which had been taken at Linten, a village three or four miles east of Morpeth.—*Thomas John Bold ; 42, Bigg Market, Newcastle-on-Tyne, October 6th, 1846.*

Occurrence of the Locust near Yarmouth.—A considerable number of the migratory

locust have been caught here this season.—*George Fitt; Yarmouth, October 7th, 1846.*

Occurrence of the Locust in Glamorganshire.—I have just received a locust from Nash Lighthouse, in Glamorganshire. I saw another of the same species at Hyde Park Lodge, caught in the garden by the lodge: several specimens of the same were exhibited at the last meeting of the Entomological Society, and were said to have been captured in various parts of England. The species is undetermined, but it is certainly not *L. Christii*.—*W. F. Evans; Admiralty, Whitehall, October 8th, 1846.*

Occurrence of the Locust in Norfolk.—The locusts have been taken in several places in Norfolk during the last month (September), and they appear to have been mostly found in pairs. I have a very fine specimen.—*Charles Muskett; Norwich, October 9th, 1846.*

Occurrence of the Locust at Pegwell Bay.—Mr. Charles Huxley captured a specimen of the locust at Pegwell, in the Isle of Thanet, on the 5th of October; he found it amongst grass.—*Henry Longley; 1, Eaton Place, Park Street, Grosvenor Square, October 12th, 1846.*

Capture of the Locust at Hammersmith.—I have had within the last fortnight two specimens of this insect brought me alive, both taken a short distance from my own residence; there is another now alive in the possession of the lodge-keeper at Hyde Park Corner, that was found in the park. I have been informed by a friend, who has just returned from Margate, that it has been very abundant along that part of the coast of Kent. I also hear it has occurred in some plenty on the Norfolk coast, near Cromer.—*S. Stevens; King Street, Covent Garden, October 13th, 1846.*

Occurrence of the Locust at Duxford and Fulborne.—A specimen of the locust has been taken at Duxford, Cambridgeshire, in a potato-field, and a second at Fulborne, in a clover-field.—*Frederick Bond; Kingsbury, Middlesex, Oct. 12th, 1846.*

Occurrence of the Locust in Scotland.—An anonymous notice in a newspaper, stated that locusts had been seen in Sutherlandshire, still further north. But without further information, no great reliance can be placed upon the statement.—*G. Gordon; Birnie, Elgin, N.B.*

Hops and Hop-flies.—Your correspondent, Mr. Walker, in his note on the Aphis of the Hop, in the 'Zoologist' for the current month (Zool. 1461), mentions having announced his attention of publishing descriptions of the British Aphides, with reference to the injuries which they cause to agriculturists and gardeners, and he takes that opportunity of requesting information thereon. Mr. Walker recommends that "the ground for the hop plantation should be *changed every year*, the new site being as far removed as possible from the old." It is unnecessary to occupy space in the 'Zoologist' with any account of the mode of culture of the hop, to show the impracticability of carrying out Mr. Walker's recommendation, it will be enough that his attention is directed to the subject before he publishes his recommendations for diminishing the numbers of Aphides and preventing their ravages. As to the further suggestion, that "perhaps it will be found advantageous to have new poles every year for the support of the hops, and the old poles may be burned in the winter," I may be allowed to observe, that if the poles were yearly subjected to the same course of pickling in a solution of corrosive sublimate that timber is made to undergo in seasoning under Kyan's process, we might reasonably expect that the end would be answered, without incurring the great expense of a fresh supply of poles every season: or, to accomplish the same purpose, apparatus might be provided, in which the poles of a whole district might

be steamed, or even boiled, at no very great cost.—*Henry Bull; Godalming, September 18th, 1846.*

[I must plead guilty to editorial negligence, in printing Mr. Walker's paper without reading it: I am certain that gentleman would, at my suggestion, have explained or omitted the apparently startling propositions he has made: hops are several years before they arrive at perfection, and then remain in full vigour, twenty, thirty, and even forty years. The poles like the hops, are also, but not equally enduring, and their annual renewal would defeat the end of cultivation, viz. profit.—*E. Newman*].

List of British Dragon-flies, as corrected by M. de Selys Longchamps.—In reprinting the following paper by M. de Selys Longchamps, I have omitted a number of synonyms which seem of no interest, particularly in those species which were previously well-known by the names assigned to them by M. de Selys.

1. *Libellula 4-maculata*, *L.* and Stephens. M. de Selys states that the *L. prænubila* of Newman is a variety.

2. *L. depressa*, *L.* and Stephens.

3. *L. fulva*, *Müller* = *L. conspurcata* and *L. bimaculata* of Stephens.

4. *L. cancellata*, *L.* and Stephens.

5. *L. cærulescens*, *Fab.* and Stephens.

6. *L. sanguinea*, *Müller* = *L. rufostigma* of Newman, and *L. rufostigma*, *L. basalis*, and *L. angustipennis* of Stephens.

7. *L. flaveola*, *L.*

8. *L. Fonscolombii*, *De Selys*. A single specimen of this insect, previously unnoticed as British, is in the cabinet of Mr. Stephens.

? 9. *L. vulgata*, *L.* M. de Selys has not seen this insect in any British cabinet, but a single female specimen, taken at Hull, and in the cabinet of Mr. Dale, is referred to it with doubt.

10. *L. striolata*, *Charpentier* = *L. vulgata* of Stephens.

11. *L. meridionalis*, *De Selys*. Two specimens of this insect, previously unnoticed as British, have occurred in the south of England, one is in the cabinet of Mr. Evans, of London, and the other in that of Mr. Wailes, of Newcastle.

12. *L. scotica*, *Leach* and Stephens. *L. pallidistigma* of Stephens, is an immature specimen.

13. *L. dubia*, *Van der Linden* = *L. rubicunda* of Curtis.

? 14. *Cordulia metallica*, *Van der Linden*. M. de Selys has not seen this species, and doubts its existence as British.

15. *C. arotica*, *Zetterstedt*. The capture of a single specimen of this insect in Scotland, by Mr. Weaver, is noticed in a previous number of the 'Zoologist,' (Zool. 750); it is there called *C. alpestris*.

16. *C. ænea*, *L.* and Stephens.

17. *C. Curtisii*, *Dale* and Stephens.

18. *Gomphus vulgatissimus*, *L.* and Stephens.

19. *Gomphus flavipes*, *Charpentier* and Stephens.

20. *G. forcipatus*, *L.* A single female specimen of this insect, previously unknown as British, is in Mr. Stephen's collection.

21. *Cordulegaster annulatus*, *Latrielle* and Stephens.

22. *Æschna pratensis*, *Müller* = *Æ. vernalis* of Van der Linden and Stephens: it is also the *Æ. teretiuscula* of Leach.

23. *Æ. mixta*, *Latreille* = *Æ. affinis* of Stephens.

24. *Æ. juncea*, *L.* = *Æ. juncea*, and *Æ. mixta* of Stephens.
25. *Æ. cyanea*, *Muller* = *Æ. maculatissima* of Latrielle and Stephens.
26. *Æ. grandis*, *L.* and Stephens.
27. *Æ. rufescens*, *Van der Linden* and Stephens.
28. *Anax formosus*, *Van der Linden* and Stephens.
29. *Calopteryx Virgo*, *L.* (in part). *M. de Selys* refers to this species *C. Ludoviciana*, *C. xanthostoma* and *C. anceps* of Stephens, together with a portion of *C. Ludoviciana* of the same author, var. β , γ , and ϵ .
30. *Calopteryx splendeo*, *Harris*. This is the *C. Virgo* of Stephens, var. α and δ .
- ? 31. *Lestes viridis*, *Van der Linden*. A single specimen in the cabinet of Mr. Evans.
32. *L. Nympha*, *Kirby* ^p = *L. sponsa* of Stephens (in part).
33. *L. sponsa*, *Hausseman*. The *L. nympha* of Stephens is the immature of this species.
- ? 34. *L. virens*, *Charpentier* = *L. viridis* of Stephens (in part). There is a single specimen in the collection of Mr. Stephens, and another in that of the late Dr. Leach.
- ? 35. *L. barbara*, *Fabricius*, previously unnoticed as British. A male and female in the Dublin Museum, under the names of *nympha* and *sponsa*.
36. *Platynemis platypoda*, *Van der Linden* and Stephens.
37. *P. pennipes*, *Pallas* = *Agrion platypoda*, var. *albicans* of Stephens.
38. *Agrion najas*, *Hausseman*. A chloridion of Charpentier and Stephens is the male of this species.
39. *A. minium*, *Harris*, Stephens, &c. *A. fulvipes* of Stephens is an immature male, and *A. Lincolnense* of the same author, an immature female of this species.
40. *A. tenellum*, *Devillers* = *A. rubellum* of Van der Linden and Stephens.
41. *A. pumilio*, *Charpentier* = *A. xanthopterum* of Stephens.
42. *A. elegans*, *Van der Linden* and Stephens. *A. ezonatum* of Stephens is a female, and *A. rufescens* of Stephens, a variety of the female.
43. *A. pulchella*, *Van der Linden* = *A. puella* of Stephens.
44. *A. puella*, *L.* (in part) = *A. furcatum* and *A. annulare* of Stephens: the latter is the female.
45. *A. mercuriale*, *Charpentier*. Previously unnoticed as British: specimens exist in the cabinets of Messrs. Dale and Curtis.
46. *A. cyathigerum*, *Charpentier* = *A. hastulatum* of Stephens, and a portion also of the same author's *A. zonatum*. — '*Annals and Magazine of Natural History*' for October, 1846, p. 217.
- The Zoologist wanted at Derby.*—"AN ORNITHOLOGICAL WONDER.—A correspondent from Carlton thus describes a singular bird, which he saw in that village, and which he calls the British humming bird. Its body was not more than an inch in length from the bill to the tail, and its bill about three quarters of an inch at least. The top of the head and back between the wings was the colour of a redbreast; and just above its tail it was spotted black or purple and white. The largest spots were highest up, being smaller and more dappled lower down. The wings were very beautifully dappled with various colours, with a large spot of bright orange towards the top end of the middle feathers of the wings. The tail resembled in shape a turkey's, and was about the size of a little finger nail. On its head were two horns, about the

length of its bill ; but its eyes or its legs I could not see. It took no more notice of my approach than a butterfly would have done ; but it flew from flower to flower, dipping its slender bill, which was no thicker than a fine sewing needle, into the cup of each blossom. It appeared not to settle on the flowers, but supported itself in the air with its fluttering wings and spreading tail while it extracted the honey.”—*Derby Mercury*.

[There is in this paragraph cause for much meditation : we have a writer competent to give a very correct description of an insect (the common and beautiful *Macroglossa stellatarum*), yet so profoundly ignorant of Natural History, as to take it for a bird !—I never recollect a parallel instance of the combination of correct observation with absence of information.—*E. N.*]

Blackberries attractive to Moths.—I was much surprised the other evening when at Hainault Forest, to find numbers of moths sucking these berries, their attention seemed quite divided between them and the sugar, those that had been partly eat by the birds appeared to be the most attractive. I mentioned the circumstance to a practical collector the following day, when he said he had observed them so engaged the week previous. Mr. Shepherd also noticed the circumstance in the New Forest.—*S. Stevens ; 38, King Street, Covent Garden, October 13th, 1846.*

To expel Mites, &c. from Cabinets of Insects, and to exclude them. (see *Zool.* 1438).—For the former purpose ; invert the drawer, uncovered, over a sheet of blotting paper, or a cloth, moistened with liquid *naphtha* for one hour or more. Steam, or fumes of prussic acid, cautiously applied, might be still more certain, but there may be special objections to each. *Naphtha* is safe, injures no specimen, and requires no apparatus. At all times, take care that the drawers *close* accurately, and keep them in a *dry* and *airy* place ; let them be supplied with plenty of *camphor*, in niches all round ; and keep a few small globules of *quicksilver* loose in each drawer. Go over all the drawers at stated periods in the year, replenishing them with camphor, and if there be any suspicious appearances, employing the fumigation above-named. Place no specimen, obtained from other collections, in your drawers, without leaving it first for some time in the fumigating box.—*A. H. H[oliday] ; September 18th, 1846.*

Feeling of Insects.—Believing myself the only one who has mentioned the circumstance, of having pierced a moth on a tree without its exhibiting any signs of animation, I cannot but consider myself alluded to by Mr. Wollaston, under the comprehensive name of Mr. John Smith, in his enquiry, “Do insects feel, or do they not ?” (*Zool.* 1434) : and therefore, may be allowed to observe, that what I advanced (*Zool.* 1343) was not intended to decide the question which he has propounded : but only to show that the struggles of impaled insects cannot proceed from pain ; and of this I feel morally certain. It is quite impossible to experiment on the millions which Mr. Wollaston says, and truly says, are passed over ; an account of the instances I I have tried would far exceed the limits to which I feel an article, in such a varied publication, ought to extend. My observations related chiefly to *Lepidoptera*, and of these I took the extremes, a diurnal and nocturnal insect ; but not from any fear that the intermediate ones would disprove my conclusions. Mr. Wollaston seems to have been unfortunate in his attempts to impale insects when at rest, without disturbing their slumbers ; and therefore it is, perhaps, useless to say that I have done so, not one, two, three, or a dozen times, but a dozen times a dozen ; and that instead of remaining quiescent for two minutes (the maximum Mr. Wollaston has ever heard of) many of them have remained so for twice as many hours. I have just impaled an example

of *Orthosia macilenta* (far from the most sluggish of the Noctuæ) with a No. 8 needle, but without removing it from its place, and have kept my eye on it for ten minutes by my watch; and it has not yet roused itself, nor is there the slightest appearance of its doing so; and I verily believe it would not move until the evening. Of the anatomy of insects I confess myself ignorant, neither do I maintain "that insects do not feel at all," because I have no means of proving it; but I contend that this sensation is not produced by their being impaled. Mr. Wollaston, I suppose, will allow that some Noctuæ when transfixed will remain motionless (if only for two minutes), others I admit are sooner roused, while others are with difficulty transfixed at all; the same is true of the *Geometra* as far as my observations have gone. Taking, therefore, (as Mr. Wollaston would) the time that elapsed before the insects are roused to measure the degree of *slowness* with which they feel, we shall have insects possessing every possible degree of sensibility, from those that require hours to feel that they are transfixed, to those which feel it instantaneously, or at all events, that the slumbers of some insects are prodigiously more sound than those of others; but can any thing be adduced to maintain either position? My opinion is that insects are roused, and therefore their struggles, occasioned chiefly by the change of position caused by the pressure which it is necessary to exert in impaling them (especially with such pins as are not unfrequently used for the purpose); and this change of position will be greater or less, according as the insect, when in repose, sits with its body more or less raised from the substance on which it rests. If you succeed (which is doubtful) in piercing one which rests with its body much raised, the pressure brings the body in contact with the substance, and thus causes an uneasy position, and the insect will struggle, but if the body be raised a little on the pin, the insect will generally compose itself as at first. Some Noctuæ which would not move when impaled, if not taken from their place, will, on such removal, become roused; but when the pin is again inserted in any substance, they will at once recompose themselves: if then the pin occasion the struggles, we shall have the effect removed, while the cause remains. Again, an impaled insect (if a Noctua) will rest during the day and struggle at night, and therefore, if pain causes the struggles, the pain must be intermittent. Impale an insect and wait until it is roused, and its struggles commence and then remove the pin, and its struggles will cease; this I think must proceed, either from the pin-wound causing no pain, or else from the insect finding itself at liberty — I shall be content with either conclusion. These may be called "miserable facts," but it strikes me they are quite as conclusive as the following argument:—Insects contain neurine, Mr. Wollaston cannot separate feeling from neurine — *ergo*, insects feel; and consequently have a sense of pain. I shall admit the conclusion, when Mr. Wollaston has supplied the readers of the 'Zoologist' with a few facts, however miserable, to show that feeling and neurine in insects are inseparable; but until he does this, he will, I think, be liable to the charge of building on "probabilities and theories," which he himself very wisely condemns. Having written thus much on the *struggling* of Lepidoptera, it is not my intention to recur to a subject, the discussion of which is anything but agreeable.—*William Turner; Uppingham, August 26th, 1846.*

Feeling of Insects.—I wish to state a few facts on this subject. *Cossus ligniperda* and *Cerura vinula*: I have pinned more than fifty, perhaps more than a hundred, of both these insects, on the palings of the Deptford Ropeground, which for some years I daily used to examine: I *never* saw any demonstration that I could attribute to pain: at evening I have observed most pinned specimens commence vibrating their wings,

and finally, fluttering violently and attempting to fly. *Vanessa Io*, *V. Atalanta*, *Argynnis Euphrosyne* : I have pinned these butterflies and placed them upon strips of cork passing across a tin box, which I kept perfectly dark and cool; whenever I opened the box, I found the wings erect and the butterflies apparently asleep. On exposing them to the sun, all these opened and spread their wings to the sun, as though enjoying it, and after a minute's interval, fluttered, but not violently: returned to the dark, they became quiescent, and appeared to sleep as before. *Bombyx mori*, the moth of the silkworm: the female pinned admits the male, lays productive eggs, and lives its period without exhibiting any noticeable change. *Æschna*, the common large dragonfly, when pinned, I have fed with flies, which it devours greedily: it has escaped with a thick short pin passed completely through the thorax; thus circumstanced, it has hawked up and down for hours avoiding pursuit; two days afterwards it has been retaken with considerable trouble, the pin still remaining in the thorax, but its apparent health and real strength and activity not perceptibly altered. These observations are of old date, and I am not likely to renew them.—*Edward Newman*.

Feeling of Insects.—While the subject of the feeling of insects is under discussion, allow me to seek from some of your able correspondents a solution of the following. It is well known to all collectors of Coleoptera, that on taking a bottle in which the insects are travelling up the glass at their customary pace, and moving about with perfect unconcern, and placing it in hot water, a tremendous hubbub ensues,—running, jumping, scrambling, and kicking, to the utmost extent of their powers. Now, if this could proceed from *feeling* their quarters unpleasantly warm, there would be no mystery about it; but, as it has been so clearly proved of late, that insects have no feeling, it is inexplicable to me why it should matter to them whether the bottle be hot or cold. While pinned, moths struggle, simply from a desire to escape; the beetles above-mentioned, must be actuated by some other motive, as they have quite as much room after the immersion of the bottle as before it, indeed rather more, owing to the expansion of the heated glass. I have tried the above experiment some hundred times, and in the end invariably with the same result, and I believe it will succeed equally with any order, and at any time of the day. I shall feel grateful to any of your correspondents who will clear up my doubts, by favouring me with the true reason of the above.—*George Guyon*; *Richmond, Surrey, September 11th, 1846*.

Description of the American variety of the common Wolf.—I beg to send you an account of the American variety of the common wolf (*Lupus vulgaris*), which was presented to me some time ago, and if you think it deserves a place in your valuable journal, you are quite at liberty to insert it. It is a female, and was brought to England when very young, from the prairies of Rockford, North America; and during confinement seemed of a very sulky disposition, evincing great fear of the human species. If any person seized its chain, it would tug in an opposite direction with great violence, endeavouring to hide itself, if possible; but it never showed any disposition to act on the offensive. On the 9th of April, 1846, I was obliged to have it killed; it is now stuffed, and forms part of my collection. It was then somewhat more than a year old, and immediately after death I took its dimensions, which are as follows:—

				ft.	in.
Length of body, entire	...	...	...	4	2
———— tail	...	...	...	1	4
———— ear	...	...	...	0	5½

Its feet are very much furred between the the balls; back of the shoulders clothed with a shaggy mane; the fur on the body is coarse and long and hard to the touch, each hair being white at the root, then annulated with black, then reddish, then white, and tipped with black, giving the back and sides a yellowish gray appearance; forehead clear gray; lower parts, insides of the ears, throat, chin, and upper lip, dingy white; tail, neck, back of the ears, and nose from the eyes to the point rusty brown; the same colour surrounding the eyes in a clearly defined ring; legs pale reddish brown; claws, tip of the tail, and naked part of the lips and nose black; irides bright orange brown; teeth were in number and situation as follows: — Incisors $\frac{6}{6}$, canine $\frac{1}{1}$, molars $\frac{3}{3}$ — $\frac{3}{3}$, = 34. This specimen has scarcely any appearance of the black ring about the wrists, mentioned in the 'Naturalist's Library,' as a marking found in adults.—*F. B. Goodacre; Lutterworth, September 1st, 1846.*

Note on a species of Delphinorhynchus. — The 'Zoologist' of this month contains a valuable notice, by M. Julian Deby, of Delphinorhynchus, which has put me in mind that during my late voyage to Jamaica, that rare Cetacean fell under my observation in somewhat interesting circumstances, a detail of which may not be uninteresting to M. Deby, and your readers in general. Perhaps you would prefer to have the notes in the freshness of the original record, and for their freshness, bear with their roughness. I merely premise, that, having been familiar with the Delphinidæ in many former Atlantic voyages, I took for granted, I should meet with some in this one, and wishing to settle the question, whether any of the true dolphins do spout, I had studied the order a little, before sailing, and in particular had made careful drawings of the form of the head of all the genera figured in Jardine's 'Cetacea,' that I might not depend on that treacherous guide, memory. November 22nd, 1844. Lat. at noon 19°, 1' N. Long. 45° 42' W.; the trade-wind blowing a most exhilarating breeze, with fine weather. Between three and four o'clock in the afternoon, a herd of large Cetaceans appeared astern, trooping towards the ship; they soon came up and began to play around us, continuing to romp and frolic in the manner of dolphins all the evening; and even long after nightfall, they were still in company, being plainly visible by the light of the moon. During this long time I had many fair opportunities of observing them. They frequently protruded their heads from the surface, and then presently the huge round back, with a small dorsal far behind, was seen. In going along beside the ship, one would occasionally turn on its back, displaying the white belly, and thus swim along. The muzzle was lengthened into a snout, but, as well as I could judge from many exposures, it tapered gradually without a furrow, and resembled that of Delphinorhynchus, which they probably were; but surely not either *D. micropterus*, or *rostratus*, which are the only species I find in Cuvier. (My grounds for this conclusion were, as nearly as I can now recollect, the animal being far too long for *micropterus*, and the dorsal too small for *rostratus*). As nearly as I could estimate from aloft, by comparison with the ship, their length was about thirty feet, or perhaps not quite so

much; the body long, black above, white beneath; the swimming-paws appeared white, even on their upper surface, but surrounded by dark colour on the body; [this is remarkable]; the lips and extremity of the muzzle appeared, when projected out of water, of a flesh-colour. They usually expired with a rushing noise, the instant the blowhole was exposed; but did not, as I believe, *spout*. Once, however, I observed a little cloud of steam sailing away on the wind from the spot where one had just disappeared; it exactly resembled that appearance which succeeds the spouting of the common Rorqual (which I have seen many times), but as my eye did not catch the animal itself, I cannot positively say that such was its origin on this occasion. The evenings being cool and refreshing after the burning days, and being generally fair, and now lighted by the moon, we spend them on deck, as the pleasantest hours of the twenty-four; this evening the wallowing of the whales added a new interest, and at nearly eleven o'clock we left them still in company. *November 23rd*. On rising we were surprised to find the whales still attending us. I now had an opportunity of seeing the profile of one very distinctly, and of assuring myself that the form of the head was exactly that of the figured *Delphinorhynchus*, no furrow being visible. One of the officers informed me that he saw one of them "breach," or leap clean out of the water. Soon after 8 a.m., they left us, having continued with us nearly seventeen hours, a period of extraordinary length, when we consider that the visits of frolicsome Cetacea to vessels, rarely last more than half an hour or an hour. During the whole of this time, the ship had been running before a gallant breeze, and had proceeded nearly one hundred and twenty English miles. — *P. H. Gosse; London, September 3rd, 1846*.

On Whales stranded on the Belgian Coast. By M. JULIAN DEBY.

(Continued from p. 1470).

BALEINOPTERA ROSTRATA, &c.

Albers, Iconogr. ad Illus. Anat. Compar, Lips. 1818, pl. 1. *Anderson*, Descrip. de l'Islande, p. 220. *Anderson*, Besch. van Island, Amsterdam, 1750, p. 165. *Artedi*, P. Ichtyol. Gen. pisc. ed. Lin. Lugd. Bat. 1738, 77. No. 3, 78, No. 4. *Ascagne*, Pl. d'Hist. Nat. Cahier, 3, p. 4. pl. 26. *Bell*, T., Hist. of Brit. Quad. and Cetacea, London. p. 320. *Bennet*, J. A. Verhandl. van Haarl. Maatch. t. 5, pars. 1, pl. 4 & 5, 1809. *Bloch*, Hist. Nat. des Cétacés, Castel. *Blumenbach*, Abbild. Nat. Gegenst. Gottingen. 1818, No. 44. *Bonaterre*, Encyc. Method. pl. Hist. Cetac. Paris, 1789, 4to. pl. 4, pl. 2, f. 2, pl. 3 & 4. *Bodel*, Nyentrius et Mülder. Allegm. Konst. en Let. Bod. van Jahr. 1836. *Brisson*, Règ. Anim. Paris, 1756, 4to, p. 391, No. 3, 4, p. 352, No. 3, p. 353, No. 6, p. 355, No. 7. *Camper*, P., Observ. Anat. sur plusieurs Cétacés, Paris, 1820. *Camper*, P. Hist. des Cétacés, Paris, 1824, 4to. p. 320. *Crantz*, Hist. du Grœnland, p. 146. *Cuvier*, G., Ossemens Fossiles, 4to. b. 5. *Cuvier*, G., Règ. Anim. *Cuvier*, F., Hist. Nat. des Cétacés, 1836, p. 338. *Dalechamp*, Hist. Nat. of Phny, Fr. Trans. Lyon, 1806, liv. ix. chap. 6, Note. *Desmoulin*, Artic. "Baleine," Diction. Clas. d'Hist. Nat. *Dewhurst*, Nat. Hist. of the Order Cetacea, London, 1834, (non

vidi.) *Dictionnaire Univers. d'Hist. Nat. dirig. par Orbigny, Artic. Baleinop.* pl. 23, Mamif. *Dubar, Osteol. de la Bal. échouée à Ostende en 1827, &c. Bruxelles, 1828. Edinburgh Encyc. art. Greenland. Eggede, Descrip. du Grœnl. tr. fr. Copenhagen, 1763.* p. 41, 48. *Erzleben, Syst. Règ. Anim. Lips. 1799,* p. 610. *Eschricht, Isis, 1845,* p. 419. *Faber, Isis, 1827,* p. 858. *Fabricius, Otto, Faun. Grœnl. Hafn. 1780,* p. 35, 36, 39. *Forster, Dr., Cook's Voyages in Kerr's Voyages, &c., xv. 4, &c. Forriep, N. Notiz. 1841,* p. 411-13. *Gmelin, Syst. Nat. ed. 13, Lips. 1788,* p. 255. *Hamilton, Robt., Nat. Lib. Cetacea, Edin. 1837,* p. 125-193, pl. 5, 6, 7. *Hunter, J., Phil. Trans. London, 1787, lxxvii. p. 383, &c., tab. 20, 21, 22, 23. Illiger, Prodrum. Syst. Mam. and Av. Berolini, 1811,* p. 142. *Johnston, Trans. of Nat. Hist. Soc. of Northumberland, i. 1829. Johnston, J., Hist. Nat. Omn. Anim. Klein, Misc. Pisc. ii. p. 12, No. 1 et 13, No. 2, 18, tab. 2. Knox, Dr., Notice communicated to Roy. Soc. of Edin. Krøyer, Isis, 1841,* p. 429. *Lacépède, Annales du Museum d'Hist. Nat. t. iv. p. 470. Lacépède, Hist. Nat. des Cetac. nouv. edit. 1840, par Desmarest, Paris, t. i, p. 243-52, pl. 4, 5, 6, 7, 8. Lesson, R. P. Actes de la Soc. Linn. de Bordeaux, xii. 16, Lesson, R. P., Hist. Gen. et Partic. des Mam. et Oiseaux decouv. depuis 1788, &c. Cetac. Paris, 1728,* p. 39-47, et 361-385. *Lesson, R. P., Man. de Mam. Paris, 1828,* p. 420-427. *Lewis & Clarke, Travels to Missouri, &c., p. 422. Linnæus, Faun. Suec. p. 50, 48. Linnæus, Car., Syst. Nat. ed. 12, Holm. 1766, 8vo., i. p. 106, No. 3, 4. Loudon, Mag. of Zool. and Bot. iv. p. 163. Martens, Reize naar Spitzbergen, Amsterdam, 1685,* p. 325. *Meckel, T. F., Syst. Vergl. Anat. 2e thl. 2e abth. p. 380, 423, 563, 593, and 4e abth. p. 527, 528. Halle, 1825, 8vo. Memoire, Descript. et Osteol. de la Bal. échouée près de St. Symphorien. Perpignan, 1830, 4to. Morren, Chas. Bydr. tot. de Nat. Wetens. Versam. & door Vauhalle, Vrölick & Müller, t. iv. 8vo. 1829,* p. 52. *Muller, J., Archiv. Für. Anat. 1842,* p. 238. *Muller, Prod. Zool. Dan. Hafn. 1776,* p. 6, 8. *Neil, Mem. of Wern. Soc. vol. i. 1811,* p. 201. *Olafsen & Povelsen, Voy. en Islande, Fr. Trans. iii, p. 231, 233. Pennant, Brit. Zool. 1776, 8vo. p. 53, No. 20. Quoy & Gaimard, Voy. &c. p. 83. Rapp, Archiv. für die Anat. von Meckel. Lips. 1830. Rapp, Beitrage zur Anat. and Physiol. der Wallfische. Ravin, Ann. des Sc. Nat. 2e serie, v. p. 266, pl. 11 et xv. (1841) p. 233, pl. 9. Reichenbach, Reg. Anim. Icon. Spec. and Car. Gen., &c. Lips. Rondelet, Hist. des Poissons, 1st part, liv. 16, chap. 8, ed. Lyon, 1558. Rondeletii, Gulielmi, Libri de Piscibus, &c. Lugd. 1554, liv. xvi. chap. xi, p. 475 et xii. p. 482. Rosenthal & Hornschuch, Epistol. de Baleinop. Gryph. 1825, 4to. Rudolphi, Abhandl. der Acad. zu Berlin, 4to. Berlin, (1820-21, printed 1822), p. 27, pl. 1, 2, 3, 4, 5. Sandifort, G., Nieuw. Verhandl. Kon. Niederl. Inst. Amsterdam, 1831, 4to. p. 255, pl. 1, f. 1, 2, pl. 2, f. 1, 2, 3. Schlegel, H., Abhandl. aus dem Geb. der Zool. und Vergl. Anat. Leyden, 1841, heft 1, et 1844, heft 2. Schlegel H., Nieuw. Verh. de 1te. Klas. Konig. Nederl. Inst. 3de. deel 1st stuk. p. 1. pl. 1 & 2. Scoresby, Acc. of Arct. Reg. Edin. 1823, p. 420. Sibbald, Phal. Nov. Edin. 1692, 4to. p. 29 & 33. Sibbald, Scot. Ann. p. 23. Sonnini, C. S., Hist. Gen. and Partic. Cétacés, Paris. an. xii. p. 193-226. Sweeting, Ann. and Mag. of Zool. and Bot. vi. 1841, p. 72. Thomson, Ann. of Philos. vi. p. 314. Troil, Lettres sur l'Islande. Van Breda, Allgem. Konst. en Lett. Bod. 1827. Verhandl., Van de, Haarl. Maatch, Deel. xi. p. 3 et Deel. xvii. p. 1. Van der Linden, Notice sur le Squelette d'une Baleinop. Bruxelles, 1828. Vrölick, W., Ann. des Sc. Nat. 2nd series, ix. (1838) p. 65. Yarrell, Proceed. of Zool. Soc. of London, 1840, viii. p. 10. and Ann. of Zool. and Botan. vi. (1841), p. 301. Zoologist, (The) edited by E. Newman, 8vo. London, p. 33.*

"A dark veil," says Lesson, "covers our knowledge of the Cetacea ; it is only by groping that we can follow this path strewn with thorns, and at a time when all other branches of natural science are being covered with flowers and fruit, cetology, reduced to meagre and shrivelled buds, many of which are sterile and sapless, leaves on our minds a most painful impression." It is generally acknowledged, that few orders of Vertebrata are established in a way which leaves so much to be desired, both as regards the distinction of species and the description of internal parts, as that of the whales. In these later times, several able naturalists have, however, paid considerable attention to this subject, and have cleared up many a dark page penned by ancient writers, who, but too often, created species on insufficient grounds, such as the sayings of sailors, or the tales of voyagers and travellers, whose exaggerated reports led them to admit numberless errors into the annals of science. These errors, copied by others, with a few supplementary exaggerations and additions, have become still more faulty, and at present only serve to torture the naturalist who attempts to discover truth amidst a tissue of false and useless indications.

No group of Mammalia has suffered more in this respect than the Cetacea ; as if the curious conformation, peculiar mode of life, and often immense size of these monsters of the deep, were not sufficient in themselves to create universal astonishment ; the older naturalists often filled up their bulky compilations with imaginary species which have no counterpart in nature, and most of their descriptions may be considered as purely fictitious, and ranged in our days amongst the many absurdities which were believed by our ancestors.

The difficulty of distinguishing truth from falsehood in a subject so intricate, is the reason why many animals which had been really observed years ago, but which have not reappeared since, have been placed (though often erroneously) among the imaginary or purely hypothetical species.

The Cetacea (excluding the Herbivora) may be divided into three groups.

1. Whales having a disproportionately large head and a dorsal fin.
2. Whales whose head is much produced, which have no dorsal fin.
3. Whales whose head is of an ordinary size.

The first of these groups comprehends two genera :—

A. Having no baleen; head thickened anteriorly and subtruncate at the apex; no folds on the under surface of the body—*Physeter*.

B. Having baleen; head attenuated anteriorly; longitudinal folds on the inferior surface of the thorax—*Baleinoptera*.

This last genus was named *Baleinoptera* by Lacépède, from the character presented by the dorsal fin, and was afterwards denominated *Rorqualus* by Cuvier. Although this last, derived from the Norwegian, signifying “Whale with folds,”* is without a doubt the most accurate, I believe it to be equitable to retain the first by clearly established right of priority.†

The external characters of the genus *Baleinoptera*, to which the animal forming the subject of this notice is referrible, are as follows :—

Body lengthened, more or less fusiform in shape; head about as long as the third of the total length of the animal, conical and attenuated anteriorly, furnished with short baleen in the upper mandible, and having two blow-holes on the upper surface; pectoral fins short, and placed at a short distance from the mouth; dorsal fin small, subtriangular, placed far backwards and curved towards the tail; caudal fin bilobed and horizontal; under-surface of the throat and thorax presenting a series of longitudinal folds, which extend as far as the abdomen.

The anatomical characters are still too little known to allow of their being used generically or even specifically, but they seem to present very important modifications; for further details of which I refer the reader to the works of those authors who have written at length on this subject.‡

Several species of the genus *Baleinoptera* were distinguished and named by some of the older writers; their descriptions, from their incompleteness, having been insufficient, have induced the greater number of modern naturalists, and amongst these men of the highest scientific authority, to unite them all into one. It must, however, be remarked, that these latter writers have seldom had, during their entire lifetime, the opportunity of seeing more than one of these individuals, whose appearance in our seas is always a rare and acciden-

* Evidently “*Rohr Waale*” and not *Rorquale*, as it has been expressed.

† It is now ascertained that no *Baleinoptera* without folds exists in Nature, and that Lacépède and some other compilers were led into error by copying bad figures.

‡ See Hunter, Camper, Cuvier, Ravin, Rudolphi, Sandfort, Schlegel, Vrolic, Müller, &c.

tal occurrence ; so that the only alternative left them was to compare descriptions, and often very diffuse ones, made by others, instead of judging personally on the objects themselves ; and this, according to my views, has led them into error.

There are even authors, who have seen nothing but more or less considerable parts of the skeleton of these whales, and I myself have not been fortunate enough to examine the bones of more than two specimens.

Having, however, read all the works which I could find in which these interesting Mammalia are spoken of, I have come to the conclusion, and am fully persuaded (although it is only with unwillingness I am ever induced to contradict the writings of learned naturalists), that several very distinct species of the genus *Baleinoptera* exist in reality, but I must at the same time own my inability in the present state of my knowledge of these animals to separate them as clearly as I could wish.*

Some of the distinctive characters of the species inhabiting northern Europe are according to my observations the following.

The first species, which attains the largest size, has the baleen entirely black, and rather long ; the pectoral fins of one single colour on the outside ; the end of the upper jaw furnished with a terminal tuft of thread-like whalebone in the adult (only ?) ; the back black or blackish (more or less maculate in the old ones) ; the folds of the thorax of the same colour as the surrounding skin ; the body much lengthened ; the pectoral fins placed further back than the anterior third of the body ; the upper lip of the same colour as the back, and the vertebræ about sixty-three ? in number.†

The second species, which is the smallest of the genus, has the baleen entirely white and very short ; never any tuft at the extremity of the upper mandible ; the pectoral fins have a white spot on the outside ; the thoracic folds are tinted with red ; the back is greenish ; the body oval-elongate ; the pectoral fins placed before the anterior third of the body ; the upper lip always spotted with red, and the vertebræ about forty-eight ? in number.‡

* Eschricht is fully convinced of the existence of four northern species. See Förh. vid. de Scand. Natf. 1843, p. 203.

† This is the *Rorqualus borealis*, *Cuv.*, to which belong the specimen stranded at Ostend in 1827, and some others.

‡ This is the true *Baleina rostrata*, *Fabr.* ; *Baleinoptera acuto-rostrata*, *Lacep.* ; *Rorqualus rostratus* of some authors ; *Rorqualus minor*, *Knor* ; and to which belongs the one mentioned in this paper.

Lastly, the third species, which seems to be the commonest, has the baleen bluish gray posteriorly, whitish anteriorly; never any terminal tuft on the upper jaw; the pectoral fins having only an external white spot in the young; the back black or blackish; the thoracic folds whitish in the young, having the intermediate canaliculations blackish in the older ones; the pectoral fins placed before the anterior third of the body; the upper lip immaculate, and the vertebræ about sixty? in number.*

It might be imagined that the differences I have just mentioned are simply the result of age or accident; here are my answers to some objections which might be made in opposition to my statements. If the colour of the baleen be entirely caused by age, why is it that, amongst others, the specimen stranded at Deptford in 1843,† and which had only attained the length of fourteen feet, had it dark,‡ while the one which I have studied, and which was nearly twice as large, had its whalebone entirely white, which colour, to agree with the generally received notion, ought to have changed to black again, before the animal had attained its full size, as the very large Baleinopteræ (answering to my first species) always have it black? I believe this transmutation to be very improbable, for amongst all the whales of this description observed until this present period, and the number of them is very considerable, no intermediate state between the dark and the white has been described, and in my third species the two colours are very distinct from one another.

Perhaps it will be said, that the colour of the baleen is quite accidental, and is of no importance as a specific character. In answer to this supposition I shall only ask, why may it not be regarded as a character which, united to others, may be successfully made use of to separate closely allied species? Do not the shrew-mice and Rodentia present good characters, derived from the colour of the teeth? Has the common whale ever been found with white baleen? What causes could effect such considerable differences in parts which correspond to the teeth of other animals, &c.?

It is only when all these questions have been answered, and that the generation and growth of the Cetacea has been carefully followed,

* To this species, the whales described by Ravin, Schlegel, Rudolphi, &c. may be referred.

† See 'Zoologist,' vol. i. p. 33.

‡ I owe the knowledge of this fact to the kindness of Mr. Gray.

that anything can be decided on this subject, which is one of very great difficulty, as well as interest.

The distance of the pectoral fins from the posterior angles of the mouth, might be supposed as varying with the greater or lesser dilatation of the folded thoracic membrane; but it is evident that the only effect, if any, produced on the anterior limbs, would be a vertical, and not a horizontal change of position.

I maintain that the colouring of the characteristic folds does not vary with age, and from the same motive stated when speaking of the baleen, that age and size have not the slightest relation with the colouring, which is constant. The red maculation of the upper lip has never been found on any other species than the ones which I regard as identical with the specimens noticed by myself.

The number of vertebræ is not yet sufficiently well ascertained to allow of its being employed as a good character, but it is exceedingly improbable that this number should be as variable as has generally been supposed, for a skeleton must have been prepared with the utmost negligence to have lost as many as seventeen vertebræ; and forty-eight to sixty-three vertebræ, are numbers too different to be supposed to exist in any *one species* of Mammalia.

I believe I may affirm, that no other placental animal produces young (one in number), which, at their birth, would be as small as those of the Northern Baleinoptera considered as one species: the measurements of specimens of all sizes, from ten feet to a hundred and twenty, having been recorded in different works.

All the preceding remarks may, without any doubt, be criticised, and most likely will be, but I doubt whether they will be easily refuted: if they only serve to attract the attention of some naturalist to this interesting subject, I shall deem myself happy to have given rise to new observations, which to be useful must be detailed and correct.

After all, is it not better to adopt a species too many, than to abolish one on insufficient grounds? In the first case, a simple notice of the error, when discovered to be really such, mends the harm for ever; whilst in the latter case, a fact is entirely lost, and a link is missing in the chain, or a mesh in the great net of the "Natural System."

The characters I have made use of are entirely external; the interior parts having seldom been described, it is next to impossible to make use of them specifically at present, but I intend on a future occasion publishing my observations on this subject.

I shall now say a few words concerning the animal which induced

me to write these lines, and which was left nearly dead by the receding tide on the sandy shore of Blankenbergh, on the coast of the province of Occidental Flanders, on the 20th of June, 1837.

It was purchased by M. Paret,* of Slykens, near Ostend, in whose cabinet I examined the skeleton last summer. It was a female,† and measured seventeen feet four inches in total length.

SP. 1. BALEINOPTERA ROSTRATA.

Osteology of the head. *Superior maxillaries* large, triangular, elongate, acute anteriorly above; each furnished with about 310 plates of baleen which are thin and white, and have their extremities fringed, the longest plates do not exceed 4 inches 6 lines in length. Near the root of these plates on the exterior side, a long band of whalebone runs parallel to the maxillary, after which the perpendicular plates take an oblique, internal direction.‡ The maxillaries are (taken separately) sloped somewhat like a roof, and form by their inferior subunion (on the palate) a nearly similar figure. The lateral, inferior blade of the maxillaries advances as far as the crest, which forms the anterior limit of the roof of the orbits.

The *vomer* is seen in the whole length of the inferior canal, situated between the maxillaries, and has the aspect of a slender, rounded rod.

The *intermaxillaries* are very much lengthened, compressed anteriorly, and leave an empty cavity in continuation of the blow-holes.

The *nasal bones* are shaped like two thick, approximating, oval-oblong tubercles.

The *frontal bone* is covered by the superior maxillary on its anterior portions, which forms apophyses which inosculate in corresponding cavities of the posterior surfaces of the maxillaries; these last,

* This is a remarkable man, who being a Flemish tavern-keeper in the little village of Slykens, and quite illiterate, has from his infancy upwards, had a love for collecting objects of Natural History and other curiosities; by dint of constant exertions, he has got together many interesting things. He possesses several skeletons of Cetacea, including *Delphinorhynchus micropterus*, the Grampus, &c.; and it was he who, in 1827, prepared the great skeleton of a Rorqual, which was shown all over Europe. No British naturalist, coming on the continent by way of Ostend, ought to miss paying a visit to this person, who is always much flattered when strangers come to see him.

† Why are nearly all stranded Cetacea of the female sex?

‡ See Hunter, Bonaterre, &c.

however, advance as far as the base of the occipital crest, following up the superior edge of the frontal bone.

Parietal bones soldered to the upper part of the temporal bones, and beneath the superior apophysis of the superior maxillaries.

The *occipital bone* advances towards the base of the intermaxillaries; its crest, which is very little developed, unites the two temporal crests. The occipital bone is depressed and concave superiorly, then convex, and after this sloping off gradually to the occipital hole. The condyles are about the same size as the bones of the ear, and present nothing worthy of notice.

The *frontal bone* has its surface concave, especially under the temporal crests; it forms an arch over the orbit, the thickest part of which rests on the temporal bone, and the other on the jugal bone.

Jugal bone very much arched, especially posteriorly, dilated anteriorly, on one side it rests on the angle of the temporal bone, and on the other, on the zygomatic apophysis of the superior maxillary, and on the lachrymal bone. The orbit is limited exteriorly by the frontal and the jugal bones.

The *lachrymal bone* is large and sub-triangular, but rather irregular; it is very much depressed, and is placed on the extremity of the zygomatic apophysis of the superior maxillary; it occupies about a quarter of the length of the suture, formed by the posterior edge of this bone with the frontal bone.

Temporal bone robust; its superior apophysis slightly curved to receive the apex of the jugal bone; its crests very sharp and prominent.

Palatinal bones rather large and covering the extremity of the inferior surface of the superior maxillaries; they are prolonged as far as the internal orifice of the blow-holes.

The *pterygoidal bones* are narrow and look like little *dog-tongues*, they are slightly curved upwards, their extremities being situated very near the auditory apparatus.

The *bones of the ear* are placed in the basilar region of the occipital bone, and look externally like two large, oviform, and convex tubercles, which it is quite impossible to describe without figures.

The central region between these bones is concave, and forms laterally on each side a small carena, which is directed on the bones of the ear, and is distinctly notched anteriorly.

The *posterior sphenoidal bone* is emarginated posteriorly in the part which covers the basilar region.

	Inches.	Lines.
Length of the superior maxillaries, from the apex to the end of the zygomatic apophysis	25 $\frac{1}{2}$	0
From the superior apophysis to the zygomatic apophysis	8	10
Length of the intermaxillaries	28	1
Greatest transverse breadth of the frontal bone	11 $\frac{1}{2}$	
Greatest height of ditto as far as the temporal crest	8	10
Length of the jugal bone	8	3
From the extremity of one of the apophyses of the temporal bone to the apex of the other apophysis of the same bone	7	0
Length of the occipital bone as far as the condyles	10 $\frac{1}{2}$	0
Length of the lachrymal bone	2	10
Length of the lower jaw	40	0
Length of the upper apophysis of the inferior maxillaries	2	1

Vertebræ. The vertebral column is formed of

- 7 Cervical vertebræ.
- 11 Dorsal.
- 12 Lumbar.
- 1 Sacral.
- 17 Caudal.

—
Total 48 vertebræ.

Cervical vertebræ ; atlas very large (three times as large as the axis), spinal processes wanting, transverse ones short, and inserted obliquely. *Axis* small, its spinal processes long, not united at their summits ; transverse processes produced. *Third vertebra* ; spinal processes united, forming a V, and furnished each with a lateral appendage ; transverse processes shorter than those of the axis. *Fourth and fifth vertebræ* ; spinal processes united at the summit, and furnished with very strong and robust lateral appendages ; no transverse processes. *Sixth and seventh vertebræ* ; spinal processes united at the summit, transverse ones long, geniculate and directed backwards.

Dorsal vertebræ, supporting ribs, the two first of which are alone joined to the sternum. *First*, spinal processes forming a V, which shape is continued all through the dorsal and lumbar vertebræ ; this first dorsal vertebra has its spinal processes not forming a lengthened blade after their union, it has two transverse processes on each side,

the superior one of which is curved downwards and the other upwards, so as to form a nearly perfect ring, which is completed by a cartilage; in this circle is placed anteriorly an oblique anterior head of the second rib.

The *remaining* dorsal vertebræ have at the base of the spinal processes an appendage on either side, which is directed towards the head; transverse processes wide and depressed.

First rib very much widened towards its junction with the sternum, which is sub-cartilaginous. The lengths of the ribs are as follows:—* First, 1 foot; second, 17 in.; third, 20 in.; fourth, $20\frac{1}{3}$ in.; fifth $20\frac{1}{3}$ in.; sixth, $18\frac{2}{3}$ in.; seventh, 18 in.; eighth, $17\frac{2}{3}$ in.; ninth, $16\frac{1}{3}$ in.; tenth, 16 in. 2 lines; eleventh, 14 in.; measured in a straight line from their point of insertion with the vertebra to their opposite extremity.

Lumbar vertebræ, shaped the same as the last dorsal, and presenting nothing worthy of notice; the twelfth has a slight rudiment of an inferior process.

Sacral vertebræ, resembling the first caudal, but having a remarkable inferior process, which is bent and directed backwards.

Caudal vertebræ; these go on decreasing in size insensibly from the first to the last, their spinal and transverse processes go on diminishing in length proportionally, so that they become obliterated on the last vertebra. The lateral appendages of the base of the spinal processes (where these exist) are placed anteriorly and are perpendicular to the vertebræ, instead of being directed forwards, as in the dorsal vertebræ. Inferior processes shaped as rounded or obtuse V's. The ten last vertebræ are more or less cubical in shape, but rather irregular, and are without processes or appendages of any kind.

Limbs, &c. The scapular measures 11 inches in greatest width, and $17\frac{2}{3}$ inches in greatest height, its coracoid process is three times as large as the acromion; humerus short, longer than wide, it measures $4\frac{1}{2}$ inches in length; radius and cubitus slightly curved, and measuring 7 inches in length; bones of the carpus placed in two rows, the external ones the largest; metacarpal bones rather large, especially those corresponding to the inferior finger.

Fingers; the first or upper formed of three phalanges, the second of six, the third of seven, and the inferior one of four.

All these bones are very much compressed; the three last of the second finger, and last four of the third are transverse.

* The Belgian foot differs somewhat from the English, but this is of very little consequence, as all the dimensions are relative.

The *hyoid* apparatus is formed of three bones; the inferior one of which is large, and has two lateral processes directed backwards, posteriorly, and a notch on the anterior margin; on each side of this notch are fastened the two other rather slender and lengthened bones.

The *ischionian bones*, which were suspended in the flesh, were very small, relatively to the size of the animal.

This short notice has been written less to establish any important fact in science, than to attract the attention of British naturalists in general to a subject which still leaves much for new observers to study. I hope that some able person, having more leisure time at his disposal than I have, will undertake the revisal of the entire genus *Baleinoptera*; and it is simply the wish of facilitating his researches that has induced me to head this paper with a list of the works which have fallen under my notice, the knowledge of which will be indispensable to his labours.

JULIAN DEBY.

Notes on some of the Birds mentioned in Shakspeare's Plays.

By T. WORTHINGTON BARLOW, ESQ.

THE interest excited by the papers on "The Reptiles mentioned in Shakspeare's Plays," by Mr. Patterson, which appeared in the 1st and 2nd volumes of the '*Zoologist*,' induced me to pen the following remarks on the birds mentioned in the same plays, which I hope may be thought worthy of a place in the '*Zoologist*,' and prove not uninteresting to its readers, as exhibiting some of the superstitions relating to birds prevalent in the days of Shakspeare.

The *Eagle*, from his undoubted position at the head of the feathered race, first demands our notice.

As in the present day, he appears to have been regarded as the personification of all that is noble and generous; accordingly we find him described in '*Henry the 6th*,' as

"The princely eagle."

And again we have the ardent looks of lovers not unaptly compared to the piercing gaze of "the bird of Heaven."

"A lover's eyes will gaze an eagle blind."—(*Love's Labour Lost*).

Again, in allusion to the great age attained by the bird, the following lines occur in 'Timon of Athens,'

"Will these moss'd trees,
That have out-lived the eagle, page thy heels?"

As is the case in most writings of an early date, we never find the *Owl* spoken of, except with a feeling of superstitious dread, as the har-binger of evil, and his note universally considered as the presage of some forthcoming calamity. The exceeding solitude and gloom of his usual haunts, and the circumstance that his voice is never heard except in the solemn stillness of the night, when all the rest of the feathered tribes are silent, seem to be the only things calculated to give rise to this impression. I am glad however to find that this silly dislike to a most useful bird is gradually declining, and I doubt not ere long, that instead of finding the owl chased and destroyed as an unwelcome visitant, we shall see him protected and encouraged as one of the farmer's best friends. Most people have hitherto been only struck with dread at his melancholy cry, and without making themselves acquainted with the habits of the bird and his great usefulness, have condemned him as an ill-favoured augur of mischief, and spared no pains to destroy him.

Thus in the 'Midsummer Night's Dream,' we have the following mention of him :

"Whilst the scritch-owl, scritch'ing loud,
Puts the wretch that lies in woe,
In remembrance of a shroud."

Again, in 'Henry the 6th' we have a series of curses concluded thus,

"And boding-screech owls make the concert full !
All the foul terrors in dark-seated hell."

And the latter is enumerated as though it was considered a most fearful addition to the wretchedness and gloom denounced.

In 'Henry the 6th,' we also find the following allusion to the birth of Richard the 3rd.

"The owl shriek'd at thy birth, an evil sign ;
The night-crow cried, aboding luckless tune ;
Dogs howl'd, and hideous tempests shook down trees ;
The raven rook'd her on the chimney's top,
And chattering pies in dismal discords sung."

Whether King Richard was the mis-shapen being in figure that we

generally have him described in history, is, I believe, a matter of dispute, some asserting that the generally received account of his deformities is not exaggerated, and others again contending that he was, on the contrary, a person of comely appearance. However this may be, we are certain that no auguries could be too dismal on the birth of a man, whose crimes and enormities were of so black a dye as Richard's, and who truly came in the words of Shakspeare,

“To bite the world.”

The gloom and melancholy of the owl's retreat, is referred to in ‘Titus Andronicus,’ in the description of a “barren and detested vale.”

“Here never shines the sun; here nothing breeds,
Unless the nightly owl or fatal raven.”

And, of his melancholy note, Lady Macbeth thus speaks,

“It was the owl that shriek'd, the fatal bellman,
Which gives the stern'st good night.”

From these gloomy habits, the superstitious dread has become attached to it which I hope soon to see dispelled, as it is a quiet harmless bird, living almost entirely on vermin, which would ultimately multiply to an excess that we should find exceedingly troublesome and destructive; and as Mr. Pemberton Bartlett well observes, “the good it does abundantly counter balances its slight poaching propensities.”

The bird which seems properly to follow the owl here, is the *Raven*, inasmuch as it has acquired the same character as a prognosticator of calamity and trouble. It is nevertheless treated by the *profanum vulgus* with more deference and respect, and some early ornithologists tell us, that this proceeds from the circumstance of its being the bird that fed the Prophet Elijah in the wilderness. Be this as it may, the raven, from the most ancient times, has been regarded with feelings of respect and fear. To the Romans there can be no doubt it was an object of great veneration.

The first mention we have of this bird is in the ‘Tempest,’ where Caliban, cursing Prospero and Miranda, says,

“As wicked dew as e'er my mother brush'd
With raven's feather from unwholesome fen,
Drop on you both.”

His retreats, like those of the owl, are of a most gloomy and sequestered kind. An old tower or dismantled building is a favourite one,

and this he renders still more melancholy by his dismal croak : thus Lady Macbeth says, on the news of Duncan's approach.

“ The raven himself is hoarse,
That croaks the fatal entrance of Duncan
Under my battlements.”

In its feeding it is much less dainty than the owl: the most filthy carrion, or even human flesh, affording it a sumptuous banquet. A most graphic description of the distressed state of an army, and of the ravens lurking after it to feed upon the dead, is given in ‘Henry the 5th.’

“ Yon island carrions, desperate of their bones,
Ill favour'dly become the morning field :
Their ragged curtains poorly are let loose,
And our air shakes them passing scornfully.
And their executors, the knavish crows,
Fly o'er them all, impatient for their hour.”

And then comes, in ‘Macbeth’ the story of their powers of augury and discovery of evil.

“ Blood will have blood :
Stones have been known to move and trees to speak ;
Augurs and understood relations, have
By magpies, choughs and rooks brought forth,
The secret'st man of blood.”

Without entering into the merits of these qualifications, it is certain that the Picæ are more sagacious and exhibit a greater amount of intelligence than any other birds. The tricks they acquire, as well as the articulation of words and sentences, by moderate tuition, is truly surprising. Added to this, most of the tribe have a remarkably cunning expression of the eye, and there can be little doubt that these circumstances, combined with its sombre plumage and gloomy habits, have originally gained for the raven the reputation it enjoys as an augur and prognosticator of events to come.

The bird which next claims our attention is the *Cuckoo*, and the following lines descriptive of its appearance occur in ‘Love's Labour Lost.’

“ When daisies pied and violets blue,
And lady-smocks all silver white,
And cuckoo-buds of yellow hue,
Do paint the meadows with delight,
The cuckoo then, on every tree,
Mocks married men, for thus sings he;
Cuckoo !
Cuckoo ! cuckoo ! O word of fear,
Unpleasing to a married ear.”

Why the cry of the cuckoo should be "unpleasing to a married ear," may not be quite intelligible to some, but the meaning I believe is this; that as the cuckoo is said to deposit its eggs in the nest of another bird, that takes upon itself the trouble of hatching and discharges the duties of a foster-parent, so to a man troubled with an unfaithful spouse, who bestows her favours upon others, the unenviable soubriquet of "cuckold" has been answered.

As the cuckoo's voice has its principal attraction in the spring of the year, when it reminds us of approaching summer, a season when its cry is unnoticed amid the crowd of more gifted songsters, so in 'Henry the 4th, we find the king admonishing his son, and telling him that a man became of importance in the eyes of his fellow men, in proportion as he kept himself aloof and preserved a distant and dignified demeanour; but that he who associated too commonly with the world

" When he had occasion to be seen
He was but as the cuckoo is in June,
Heard, not regarded."

A singular superstition with regard to the *Cock* is recorded in 'Hamlet.'

It appears that the first crow of the cock in the morning, was believed to be the signal for all sprites to betake themselves to their quarters, and that on Christmas eve, the bird kept up a constant crowing all night, to deter these spirits from coming forth at all. To give the story correctly, I transcribe the lines, which are as follows,

" HOR. I have heard
The cock, that is the trumpet to the morn,
Doth with his lofty and shrill-sounding throat
Awake the god of day; and at his warning,
Whether in sea or fire, in earth or air,
The extravagant and erring spirit hies
To his confine: and of the truth herein
This present object made probation.
MAR. It faded at the crowing of the cock.
Some say, that ever 'gainst that season comes,
Wherein our Saviour's birth is celebrated,
This bird of dawning singeth all night long:
And then, they say, no spirit walks abroad;
The nights are wholesome; then no planets strike,
No fairy takes, nor witch hath power to charm,
So hallow'd and so gracious in the time."

Throughout the writings of Shakspeare we find frequent mention

made of the *Turtle*, and in all cases, as an example of constancy and affection.

So Florizel, in addressing Perdita (*Winter's Tale*), thus speaks ;

“But come ; our dance, I pray:
Your hand, my Perdita : so turtles pair,
That never mean to part.”

Of the truth of this alleged attachment on the part of the turtle for its mate, I have never had an opportunity of satisfying myself ; though it has ever been a favourite theme for the poet and the moralist. Further on we have the following comparison of a widow to a turtle that has lost its mate ;

“ I, an old turtle,
Will wing me to some wither'd bough ; and there
My mate, that's never to be found again,
Lament, till I am lost.”

Of the peculiar formation of the digestive organs of the *Columbidæ* the poet was evidently aware, as we find from the words of Hamlet.

“ But I am pigeon-livered, and lack gall
To make oppression bitter.”

The absence of the gall-bladder in these birds seems to be compensated for by the extraordinary development of the crop, by the aid of which, the food becomes so thoroughly digested before it enters the intestine, that the gall is rendered unnecessary—the crop is also useful to macerate the food for its young, and being (unlike that of other birds) capable of great distension by air received through the wind-pipe, the bird is able, by expelling this, to bring up with it the softened food into the bill of the young one waiting to receive it.

This peculiar absence of the gall-bladder has given rise to the expression, with reference to men, of an easy and supine temperament, that they have “ no more gall than a pigeon.”

The birds I will next notice are the *Nightingale* and the *Lark*. None seem more worthy of the poet's lay,” but how a woman without a *tongue* should be transformed to so delightful a songster as the former, according to the story of *Tereus* and *Philomela*, I am at a loss to say. Its sweet and plaintive song has gained for it universal admiration, in spite of its plain and unpretending appearance.

“ Here can I sit alone, unseen of any,
And to the nightingale's complaining notes,
Time my distresses and record my woes.”—*Two Gentlemen of Verona*.

The *Lark*, though as unassuming in plumage as the nightingale, has been a favourite theme of the poets, and by none has its song been so exquisitely described as by our great and immortal dramatist.

“The lark, whose notes do beat
The vaulty heaven so high above our heads.”—*Romeo and Juliet*.

And again, in *Cymbeline* :—

“Hark ! hark ! the lark at Heaven’s gate sings,
And Phœbus ’gins arise,
His steeds to water at those springs
On chalic’d flowers that lies.”

There is something singularly beautiful in the lines I have just quoted.

There are yet two more that remain for me shortly to mention.

First, the *Pelican* ; in connexion with which, we find the following passage in *King Lear*.

“’Twas this flesh begot
Those pelican daughters.”

The meaning of this expression is evidently this, that as the young pelicans are fabulously reported to exist on the blood which they draw from the breast of their parent, so had these daughters, of which *Lear* is complaining, by their misconduct wounded their father’s breast and made his heart bleed.

Last, comes a word on the *Swan* :—

“Let music sound, while he doth make his choice ;
Then, if he lose, he makes a swan-like end,
Fading in music.”—*Merchant of Venice*.

The story of the whistling of the dying swan seems now almost entirely exploded ; the interesting observations of Mr. Waterton (*Zool.* 674) are confirmatory of the extravagance of this notion : indeed so widely diffused has the love of Natural-History research gradually become, as to leave but little ground for the reception of these idle fables.

T. W. BARLOW.

Holmes Chapel, Cheshire,
August 5th 1845.

NATURALIST'S CALENDAR FOR DECEMBER.

BIRDS.—On the 10th grouse shooting ends. The ptarmigan (*Lagopus mutus*) has now assumed its pure white winter livery, and all the waders are now in full winter plumage. The various species of gulls often visit inland districts at this season of the year, and in company with rooks, follow the plough in search of worms and the grubs of the cockchafer (*Melolontha vulgaris*). The golden plovers assemble in immense flocks on commons, and in open fields, and if the weather proves severe, the fieldfares, redwings, and other species, descend to low marshy districts, where they find a sufficient supply of various insects.

INSECTS.—But very few insects are to be found in this month, though some of those which appeared last month may still be taken, if the weather is mild.—*Henry Doubleday*; *Naturalist's Almanack* for 1845.

Nidification of some Australian Birds.—On looking over vol. iii. of 'Audubon's Ornithological Biography' a few days ago, I was struck with the great difference between the account there given of the nidification of the booby, gannet, and two species of tern, and my own notes on the same subject made in 1844 and 1845 on the north and north-east coasts of New Holland. The birds I allude to are the *Sula fusca*, *Anous stolidus*, and *Thalassipora fuliginosa*. Of the brown booby of North America, Audubon states, "In all the nests which I examined, only one egg was found, and as most of the birds were sitting, and some of the eggs had the chick nearly ready for exclusion, it is probable that these birds raise only a single young one, like the common gannet or solan goose," p. 64. Among the numerous nests of the booby on Bramble Cay, Torres, Straits, in every instance I found *two* eggs, one usually much soiled, and the other quite clean. According to Audubon, in the Tortugas, the nests of the noddy contained *three* eggs each, p. 516. On Raine's Islet and Bramble Cay I never found more than a single egg or young bird in one nest out of many thousands which I must have seen, and the same had been previously observed by Mr. Gilbert on Houtman's Abrolhos, off the west coast of New Holland, (see 'Annals and Mag. of Nat. Hist.' vol. xiv. p. 450). Again, with regard to the sooty tern, Audubon mentions (p. 266) that it "always lays three eggs as its full number," and moreover that "there is less difference between their eggs than is commonly seen in those of water birds, both with respect to size and colouring." On the other hand I have invariably found the sooty tern to lay only a single egg, which, besides exhibited such differences in the size and distribution of the markings, that a series of a dozen or more between those covered with large blotches and others with faint markings, with all the intermediate gradations, might easily be picked out. The circumstance thus briefly related, naturally led me to speculate on the probable causes of such marked differences in nidification, and I am inclined to adopt the easiest mode of accounting for them, by at once cutting the Gordian knot, and questioning the specific identity of the Australian and American species, although Mr. Gould, our first authority on the subject, has failed to detect any specific distinctions after a careful examination of specimens from both countries. This appears to be a case for the decision of the comparative anatomist, who, in the present state of the question, alone can set the matter at rest.—*John MacGillivray*; *Old Aberdeen, September 25th, 1846.*

Arrival of Birds, &c. at Warnford in 1846.

February 27th. The gray wagtail (*Motacilla boarula*) still to be seen in its winter plumage and haunts.

March 29th. Eggs of the song thrush hatched.

„ 30th. Chiffchaff heard. — Blackbird's eggs hatched. The nest occupied a curious position for a blackbird, being placed between one of the bottom rails of an old gate and a wall against which it rested.

April 1st. Willow warbler seen.

„ 4th. Common whitethroat.

„ 8th. Blackcap.

„ 14th. Nightingale.

„ 19th. Swallow—Sedge warbler—Wheatear first seen—Fieldfares not gone.

„ 24th. House-martins. I have not observed any notice taken of the number of martins being smaller than usual this year, but in common with others, have remarked it in this neighbourhood. On my own house, where their nests have been too abundant (as mentioned in 'Zool.' 763), I have only had half a dozen nests built this season. A few more were begun, but for some reason or other the birds desisted. I have not seen anything like the usual number of these cheerful visitors. Last year there were a great many, and then the number of the smaller warblers appeared less than common, which I attributed to the late spring and very cold weather.

April 24th. Cuckoo heard.

May 4th. Lesser whitethroat. A pair of these pretty little birds usually frequent a neighbour's garden during the summer months, and this year they paid my garden sundry visits. They seem very partial to flowers, and I have seen them busy on the dahlia as late as September 23rd. My neighbour tells me they once destroyed a very handsome *Tropæolum*, and he bears them no good-will. According to my observation, the two sexes keep much more in company than the common whitethroat, in this respect differing from it, as the gold-crest does from the common wren. I believe this little gray-coated whitethroat builds its nest in an osier-bed opposite; it is frequently seen to come from thence.

May 6th. Turtle-dove.

„ 11th. Swift—but I am told it was seen by another person on April 26th.

„ 15th. Red-backed shrike.

August 30th. Gray wagtail, seen on the river's brink. It has since been frequently on the ledge of our window (Zool. 763). I don't remember that it paid us a single visit last year. I was told by a bird-collector at Yarmouth, Isle of Wight, that this wagtail is considered rare. In this part of Hampshire it is, on the contrary, one of the commonest birds in autumn and winter; but I have nowhere seen in this neighbourhood the common yellow wagtail (*Budytes Rayii*).—*Edward H. M. Sladen; Warnford, near Bishop's Waltham, October, 1846.*

Remarks on the Migratory Birds in the vicinity of Holmes Chapel, Cheshire.—Communications respecting the local migrations of birds being invited by the Editor of the 'Zoologist,' I take the liberty of forwarding the subjoined notes for insertion in that periodical. I am afraid my observations are very incomplete, for I have been prevented for a considerable time, by untoward circumstances, from following up my Natural History pursuits with the regularity and assiduity that my inclination would otherwise have dictated, but their correctness, as far as they go, I will venture to affirm may be fully relied on :—

April 12th. A few willow-wrens were seen this morning for the first time, apparently very shy and disinclined to show themselves; as the day advanced they increased in numbers.

April 13th. Tree Pipit.

„ 14th. A single swallow was seen to day. They did not appear in any number until the 20th. Wood Wren.

April 17th. Redstart, Blackcap Warbler, Meadow Pipit.

„ 18th. Cuckoo heard. A party of sand martins appeared on the Dane for the first time.

April 19th. Common Whitethroat.

„ 21st. Sedge Warbler, Swift.

„ 53rd. House Martin.

„ 28th. Landrail heard.

„ 30th. European goatsucker.

The winter was so unusually mild, that partridges were hatching at the end of February. A number of yellow wagtails also remained with us throughout the winter. The jack snipe (*Scolopax gallinula*), constantly stays with us in considerable numbers during the summer, and breeds in a morass in the adjoining parish of Brereton. At this place, in bygone days, was to be found an unusually choice assemblage of rare water birds, but the system of drainage which has been so extensively carried on, to the great advantage, no doubt, of the agriculturist, but to the equal detriment of the naturalist, has caused a considerable diminution both in the number and varieties of the aquatic birds, for which the numerous meres and pools with which this county is studded were formerly such a favourite resort.

A few words on the subject of partial migration, to which the attention of contributors has been so earnestly requested by our Editor. The goldfinches principally leave us for the winter, a fact which Mr. Newman has recorded as taking place in Herefordshire. Another fact I must here mention, which, although perhaps not coming strictly under the head of partial migration, has still some connexion with it, and is, if possible, of a more interesting character. The mountain finch (*Fringilla montifringilla*), which used to be, within a few years past, very common in this neighbourhood, has now almost forsaken us, and from being one of our commonest, may be considered one of our rarest birds. Similar apparent acts of caprice on the part of birds have been often recorded. Wilson, for instance, in his 'American Ornithology,' relates that a bird of the snipe kind, which he calls, from its cry, the Pill-will-willet, "generally begins to lay about the 20th of May, which is said from some unknown cause to be two weeks later than it was twenty years ago." For such occurrences there exists, no doubt, some good reason, though inscrutable to us. I have sometimes fancied that I could detect a migration of the hen chaffinches, as suggested by White of Selborne. In the winter when the Fringillidæ are gregarious and feed in immense flocks on the stubbles, a good opportunity has presented itself for observing the comparative rarity or frequency of the two sexes of this species, and there has generally appeared to me on such occasions, a preponderance in the number of males.—*T. W. Barlow; Holmes Chapel, Cheshire.*

Dates of arrival of Summer Visitants at Stowmarket.—The following are notes I have made, upon the first appearance in this neighbourhood of some of our summer visitants. Two or three of the dates were recorded by a friend in the neighbourhood, the others were the result of my own observations.

April	5th.	Blackcap (male), <i>Sylvia atricapilla</i>
"	5th.	Wryneck, <i>Yunx torquilla</i>
"	12th.	Nightingale (male), <i>Sylvia luscini</i>
"	13th.	Redstart (male), <i>Sylvia Phænicurus</i>
"	15th.	Blackcap (female), <i>Sylvia atricapilla</i>
"	15th.	Willow Wren, <i>Sylvia trochilus</i>
"	15th.	Swallow, <i>Hirundo rustica</i>
"	15th.	Nightjar, <i>Caprimulgus europæus</i>
"	21st.	Greater Whitethroat, <i>Sylvia cinerea</i>
"	21st.	Cuckoo, <i>Cuculus canorus</i>
"	27th.	Lesser Whitethroat, <i>Sylvia sylvia</i>
"	27th.	Whinchat, <i>Sylvia rubetra</i>
"	27th.	Stonechat, <i>Sylvia rubicola</i>
May	6th.	Swift, <i>Hirundo apus</i>
"	10th.	Red-backed Shrike, <i>Lanius collurio</i>
"	15th.	Gray Flycatcher, <i>Muscicapa grisola</i>

Several of my friends first heard the nightingale on April 12th, Easter Sunday, one day earlier than last year. There are several upon which I have not had an opportunity of making any observation. Most of the above, nest in my garden and grounds. Thrushes have this year nested some weeks earlier than usual: a brood of missel thrushes were hatched in a bunch of missletoe growing upon a willow tree, near my pond, on the 1st of April; and I saw young song thrushes flying about my garden on the 12th of April.—*C. R. Bree*; *Stowmarket, June 15th, 1846.*

Dates of arrival of Migratory Birds in Norfolk, Suffolk, and Cambridgeshire.

1845.

Oct.	10th.	Fieldfare, Stetchworth, Cambridgeshire.
"	14th.	Woodcock, Elden, Suffolk.
"	15th.	Hooded-crow, Stetchworth.
"	28th.	Redwing, Stetchworth.

1846.

Jan.	26th.	Stockdove, Elden.
"	27th.	Black and White Wagtail, Eriswell, Suffolk.
March	14th.	Lapwing, Stetchworth.
"	15th.	Chiffchaff, Stetchworth.
"	21st.	Wryneck, Stetchworth.
"	24th.	Ringed Plover, Barnham, Suffolk.
April	1st.	Wheatear, Elden.
"	8th.	Thick-knee, Elden.
"	9th.	Blackcap, Elden.
"	12th.	Nightingale, Elden.
"	12th.	Willow-wren.
"	13th.	Redstart, Chippenham, Suffolk.
"	13th.	House-martin, Elden.
"	14th.	Sand-martin, Elden.
"	14th.	Swallow, Stetchworth.
"	17th.	Garden-warbler, Elden.
"	19th.	Greater Whitethroat, Stetchworth.
"	20th.	Ring Ousel, Elden.

April	21st.	Whinchat, Kennet, Suffolk.
"	23rd.	Dotterel, Newmarket, Cambridgeshire.
"	27th.	Lesser Whitethroat, Stetchworth.
"	27th.	Red-backed Shrike, Stetchworth.
"	29th.	Cuckoo, Stetchworth.
May	7th.	Turtle-dove, Elden.
"	8th.	Swift, Thetford, Norfolk.
"	20th.	Gray Flycatcher, Stetchworth.

The above were kept by myself and friend, W. Lloyd, Esq., to whom I am indebted for many pieces of information on the subject of birds in general. I have only recorded the earliest ascertained arrivals at whatever place they might happen to be. By the ring ousel being in the list, it must not be supposed that it is an annual visiter to these parts, on the contrary, with the exception of one, mentioned by Mr. Salmon to have been shot at Brandon; this is the only one I ever heard of being seen hereabouts: it was seen in the garden here, but before a gun could be procured, it had taken its flight.—*Alfred Newton; Elden.*

Kestrel preying on a Rat.—I killed a young female kestrel on the 30th of last month, and found in its stomach the remains of a rat; one of its hind legs had been swallowed whole and was quite perfect, appearing by its size to have belonged to a full-grown one. Not having seen it mentioned in any work on Ornithology that the kestrel ever feeds on rats, I thought this fact might prove interesting to some of your readers. Gamekeepers and other persons who destroy this bird, from the belief that it kills young game, should consider that vermin is its chief food, and that if it is now and then guilty of feasting on a young partridge, it far more than counterbalances the mischief it does, by the quantity of vermin which it destroys.—*Nicholas Cooke; Hope Mills, Harrington, November 13th, 1846.*

Occurrence of the Hooded Crow near Stourbridge.—I have this morning received a specimen of the hooded crow, killed in the preserve of J. H. H. Foley, Esq., of Prestwood, near Stourbridge, Worcestershire; what should entice so rare a bird into this district we are at a loss to know.—*W. Birch; November 18th, 1846.*

White Starling and curious facts respecting Starlings' Eggs.—I lately saw, at Blaby in Leicestershire, a white starling. It was found in a nest containing other young ones of the ordinary colour, and taken to my friend, Mr. John Clarke, who tried to rear it; but he thought it had been injured by its captors, as it did not live many days. The colour is much purer than is usual with birds which are called white varieties. This summer the Rev. E. A. Giraud, Fellow of Dulwich College, found on the lawn of their garden a starling's egg on six successive mornings, all of which were deposited within an area of two square yards. It is well known that a bird will drop an egg in almost any place, if its nest has been taken before the full number of eggs has been deposited, but the preceeding is a most extraordinary occurrence.—*William Turner; Uppingham, Oct. 6th, 1846.*

Occurrence of a Swallow new to Britain at Uppingham.—A little bird of the swallow tribe has come into my hands, which I do not at all know. It was rather badly shot in the head and neck, but I skinned it as carefully as I could, and I think it sufficiently perfect for accurate description. And if the following general account induce you to think it anything new, I shall be most happy to lend it you for the purpose of being figured and described in the 'Zoologist.' Weight, less than an ounce; throat, belly, vent, and rump smoke-coloured, all the rest black; back and wing-coverts glossy,

and the head rather so. The tail is forked, but not very acutely; wings very long, being nearly $4\frac{1}{2}$ inches. I fancy it is a swift.—*William Turner; Uppingham, November, 12th, 1846.*

[On receiving this obliging communication, I wrote to the Rev. Mr. Turner, requesting the loan of the bird, which I hope to name, figure, and describe in the next number, but I thought Mr. Turner, as well as my subscribers were entitled to this early notice of so interesting a fact as the occurrence in Britain of another straggler of the swallow tribe.—*E. Newman*].

Anecdote of confidence in the Swallow. The following instance of confidence in a swallow deserves a place in the 'Zoologist.' One side of the Wellingborough station may be called a roofed platform, under which are two lamps, their height from the platform cannot, I think, exceed eight feet, and yet on the top of one of these a swallow built her nest, and incubation was going on, though hundreds of people must be daily congregated there, whose heads can be little more than two feet from the lamp: when I saw it, she had left her nest, but soon returned, and after wheeling in her flight two or three times just over our heads settled on her nest without betraying any symptoms of alarm.—*William Turner; Uppingham, Sept. 6th, 1846.*

Occurrence of the White-winged Crossbill near Carlisle.—Several specimens of the white-winged crossbill have been killed in Cumberland, near Walton house, some ten miles east of Carlisle. I had two females sent me by T. C. Heysham, Esq., of Carlisle, for the purpose of preservation.—*James Cooper; Preston, October 12th, 1846.*

Curious deviation from its ordinary habits of the Kingfisher. The following remarks on certain peculiarities on the habits of the kingfisher, perhaps induced partially by the nature of the locality, may not prove uninteresting to the readers of the 'Zoologist.' It is stated, I think, in all the books on Natural History, with which I am acquainted that the kingfisher, when on the look out for food, remains perched on some stick or twig, and from thence pounces on its prey. This is undoubtedly true as a general remark, but it is not universal, as is evidenced by the following fact which I have witnessed frequently at all seasons of the year. When walking on the sea shore between Charmouth and Lyme Regis, in Dorsetshire, when the tide was down, I have very many times seen kingfishers fishing in the little pools which were left among the rocks by the receding tide. Now, as there are no trees or bushes in such localities on which to elevate itself, the bird here takes quite a different method for attaining its ends, but which is equally effectual. Instead of waiting in one spot for the fish to approach it, it flies from one little pool to another, and suspends itself in the air over each, at an elevation of about four feet or so, exactly as the kestrel does, and on observing its prey, darts down upon it, in the usual way. This appears to me to be a deviation from its ordinary habits in two ways, first, in its being found on the sea shore at all, in preference to the wooded banks of the streams, of which there are plenty close at hand, and next, in its hovering in stead of perching, previous to pouncing on its prey. Had it been driven to the sea shore by hard weather, I should not have been so much surprised, but this was not the case on any of the occasions on which I observed it in that situation, but on the contrary the weather was mild and open, so that the bird being there appears to have been a matter of choice, not of necessity. Many birds are driven to the sea shore in hard weather, but this is not extraordinary; I have several times seen the common snipe, in very severe frost, on the hard shingly beach at Charmouth, which one would think to be a situation most unfit for the ten-

der and delicate beak of this bird; yet even this is better than the frozen ditches, where no food is to be procured in any way. In the case of the kingfisher however it appears to have been a matter of choice, and its instinct led it to the only way in which it could obtain access to the abundant supply of food presented to it. The inducement to frequent the sea-shore probably arises from the abundance of small fish and marine insects in the pools, rendering it a smaller act of labour to obtain a sufficiency of food there, than in its more natural habitat, viz. the streamlets of the district. I shall now leave the matter to those who may wish to investigate more deeply the causes which led to such a deviation from the ordinary customs of our only kingfisher, being content myself with simply recording the fact as having occurred under my own observation.—*Beverly R. Morris, A. B., M. D.; York, September, 25th, 1846.*

Occurrence of the Red-necked Phalarope in Norfolk.—I received last week from Salthouse, on the northern coast of this county, a specimen of the red-necked or lesser phalarope (*Phalaropus hyperboreus*), which I have reason to believe is the fourth individual of this species which has been procured at Salthouse during the present autumn. The last Norfolk specimen of this bird which came under my notice, previously to the above, occurred several years since in the adjoining parish of Weybourn.—*J. H. Gurney; Easton, Norfolk, November 14th, 1846.*

Occurrence of the Gray Phalaropes near Penzance.—A large number of these birds have been observed on our coast during the past fortnight, and nearly all the examples that have been obtained, appear to be extremely emaciated. Several I have heard of, have been chased down on the sea-shore and inland in a state of great exhaustion, others have been found dead. It is probable that there must have been a simultaneous movement of these birds from their northern habitat, most likely just before the late severe gale from the S.S.E. which perhaps met them and opposed their progress southward.—*Edward Hearle Rodd; Penzance, October 16th, 1846.*

Occurrence of the Gray Phalarope near Honiton.—A specimen of that rare and beautiful bird the gray phalarope (*Tringa lobata*), was shot this morning on the river Otter, near this town; it has but partially acquired its winter plumage.—*Edward Murch; Honiton, October 12th, 1846.*

Occurrence of the Gray Phalarope near Preston.—A male specimen of this bird, in mixed plumage, was killed near this town, on the river Ribble, in company with another, which though wounded made its escape.—*James Cooper; Preston, Oct. 1846.*

On the noise made by the Snipe.—On looking over your interesting periodical, the 'Zoologist' of the present month, I find some further observations on the noises produced by the snipe, in the breeding season, the writer alludes to another sound produced by the snipe which he describes as resembling the sharpening of a saw without its harshness, and, supposes this might be the sound referred to, by Mr. Bree, (Zool. 1066), if so, I quite agree with Mr. Fisher, that this sound is produced while the bird is on the ground, as well as when on the wing, but, I cannot understand how the term "whorring" could be applied to it, for if we deprive the sound produced by the sharpening of a saw of its harshness, we reduce it to that produced by friction, such as the cutting of cork with an indifferent knife, or the axle of a barrow-wheel that wants greasing, and indeed the comparison by Mr. Fisher was not a bad one, I however understood "whorring" to refer to that sound called "humming" by the Rev. J. C. Atkinson, and which both that gentleman and Mr. Fisher agree as being produced, only while the bird is on the wing, and by a peculiar mode of flight: if, however, Mr. Bree still means by "whorring" to refer to the noise called "humming"

by Mr. Atkinson, he would not stand alone in supposing the noise is produced by the voice of the bird. I am acquainted with one gentleman, who holds the same opinion, and as there is a divided opinion upon the subject, I hope that Mr. Bree (when he has an opportunity such as he formerly described) will pay particular attention to the subject, and give us the benefit of his observations whatever they may be. Before leaving this topic I may be allowed to observe that many birds are in the habit of making noises with their wings, some in their ordinary flight and others while wheeling about, or ascending from a height towards the earth: of the first the common golden eye is an example which makes a loud whistling sound when flying; of the latter, the sanderling, dunlin, and ring plover, when wheeling about or descending in flocks may be heard at a great distance: I recollect too on one occasion, while bending over a partially devoured salmon-trout, I heard a strong rushing noise and on looking up beheld a lesser black-backed gull (*Larus fuscus*) within two yards of my head; on my looking up it immediately ascended with a smooth curved sweep without moving its wings. I stooped over the fish again, and again it came down in the same way for several times, making each time a rushing noise like a strong breeze passing through the foliage of a tree. Partridge, grouse, pheasants, &c., all make a loud whorring noise when they first rise from the ground, as is well known by every sportsman. The difference of the sounds thus produced are occasioned most probably by the structure of the wing. That the sound made by the snipe may (not inaptly) be called bleating, I may quote the effect it had upon myself the first time I noticed it: I was returning in the dusk of the evening across the edge of a peat-moss skirted with moor and young fir-plantations where I had been to look for goatsuckers: after crossing a thick hedge of furze and bramble, and proceeding about thirty yards, I heard what I at once took for a sheep, and as it was very late in the evening I supposed it must have been one that had got entangled in a bramble-bush: I immediately retraced my steps, to look for and render it assistance. I had recrossed the hedge and was just beginning to look about, when I again heard the noise which now seemed to come from the side of the hedge I had left, again I recrossed the hedge, and again I heard the noise but in a different direction. I now became a good deal puzzled and stood still not knowing what to do, in a short time, however, I discovered that the sound was above my head and moving from one place to another: this was all I could ascertain at the time, for it had now become quite dark, and I could not see the bird. A few weeks after this, while passing along the margin of the Carlisle canal reservoir I again heard this peculiar sound; it was now mid-day, I did not let the opportunity slip, but by patience and attention, I not only ascertained what made the noise, but (I hope I may assert without offence) how it was made. This sound when the bird is not far distant, resembles the tremulous bleating of a ewe responding to her lamb: when at a distance, it is not unlike the humming of an entangled bee, having a more tremulous or shaking sound than when the same insect is on the wing. As respects the deceptiveness of the voices of birds mentioned by Mr. Atkinson, I have often noticed it, but never tried to account for it, yet I think it may sometimes be partly accounted for by the position of the listener in reference to the bird and the passing breeze, or by the stronger or subdued character of the tones in which the bird is calling or singing. Often have I been deceived in the latter way by the pied wagtail (*Motacilla Yarellii*), while I have been straining my eyes to find it at forty yards distance, it has been perched upon a stone, eight or ten yards from me, occasionally uttering a note or two in quite a subdued tone, until at length, probably supposing I had approached

near enough, it would suddenly spring from the stone, uttering its loudest notes, and leaving me to wonder how I could possibly have overlooked it. The eddying of the breeze round rocks, banks, or bushes, or the frequent turning of the bird's head while calling or singing, may have the effect of deceiving us as to the distance or the whereabouts of the bird. I have, while listening to the cornercrake, observed the call to sink and swell each two or three calls, sometimes having the appearance of being at a considerable distance, the next moment close at hand. I have been much deceived occasionally, in point of distance, in the way Mr. Atkinson was with the moorhen; once I expected to find a quail about forty yards over the hedge, but had to go over several fields, when at length I got within fifteen or sixteen yards: here I listened some time, having my head close to the ground to keep out of sight; the call now appeared very loud, and had a ringing tone with it as if coming out of some large empty vessel: in the progress of my pursuit, I still thought it only a short distance before me, and should certainly have given it up, had I not been most anxious to ascertain by putting the bird up, that it was really the quail which made the noise: I did so at last and was satisfied.—James Cooper; Preston, October, 1846.

Occurrence of Tringa Schinzii near Penzance.—On Tuesday last, an adult male and female of this rare species of *Tringa* were killed at Hayle Estuary, about seven miles from this place, on the north coast, by Mr. W. H. Vingoe. The male had nearly completed its autumnal moult, but the female's winter plumage was not so far advanced. The general appearance of both birds resembles the dunlin, under the same circumstances. The special characters of this species, in reference to *T. variabilis*, namely, its smaller size, shorter beak, and the white upper tail-coverts correspond with the descriptions given by Messrs. Gould, Yarrell, and Temminck. There did not appear the slightest difference in size and dimensions on my comparing the specimens now under notice with Gould's figures, and scarcely any difference in colour. The length of my examples, and of course, those of Gould, do not accord with Yarrell's statement in these particulars of the bird, from which his drawing was taken. The smallest of my birds (the male) measured exactly $7\frac{1}{2}$ inches in length, and the female about $\frac{1}{8}$ th of an inch more, whereas the length given by Mr. Yarrell of his example, is $6\frac{1}{2}$ inches, a remarkable difference in so small a bird. I observe also in both of my specimens, that the wings exceed the tail by as much as they are represented in Mr. Yarrell's figure to be shorter. Both individuals, now under notice, are fully adult birds. On dissection, the several distinctions in both were at once plainly discernible. The birds were extremely fat and plump; and one was in company with several dunlins and ringed plovers; the other was shot aloof from the flock; their note is represented to me as shorter and sharper than that of *T. variabilis*.—Edward Hearle Rodd; Penzance, October 19th, 1846.

Note on the occurrence of the Black Swan in Britain.—I was reminded by your note on the Black Swan (Zool. 1501) of some passages I copied from Mr. Colquhoun's 'The Moor and the Loch,' p. 41, note. "Wild geese, bernacle, brent geese, &c. seldom pitch upon the Highland Lochs, the former only for a short time to rest. Last winter (1841) some flocks of wild geese, the common gray lag, appeared on Loch Lomond during the first storm, * * * *. It is a curious fact that there were fewer hoopers last winter (1841) than in many of far less severity. During the severe winter of 1837-38 not one wild goose of any description was seen although there were numbers of the common wild swan and a few of the black species, one of which was shot."—John Wolley; Beeston, near Nottingham, Oct. 3rd, 1846.

Occurrence of Wild Geese, Terns and Gray Phalaropes at Worcester.—On Sunday last, between one and two o'clock in the afternoon, a large flock of wild geese passed over the city of Worcester, shaping their course nearly due west; it is rather unusual to see these migrators thus travelling by day as they mostly travel by night. There has been shot on the banks of the Severn, near this city, a specimen of the common tern (*Sterna hirundo*, L.), and of the Arctic tern (*Sterna arctica*, Temm.), both young birds; their being shot so far inland, indicates rough weather on the coast. Also two specimens of the gray phalarope (*Phalaropus lobatus*, Flem.); this is a rare visitant, and as its equatorial migrations are said not to extend far beyond the limits of the Arctic circle, it would appear that we are more indebted to the rough and boisterous state of the weather, for the capture of these birds as British, than from any migratory desire on their part to pay us such a visit, their delight being in the icy and desolate regions of extreme northern latitudes.—*George Reece; Museum, Worcester, October 15th, 1846.*

Occurrence of the Tern at Pont-y-Pool.—The late equinoctial storms have been again driving specimens of *Sterna hirundo* inland. One was shot flying about the canal near this town, and brought to me last Monday (October 12th). I have not heard of any having been seen here since there were so many driven up the valley of the Severn a few years ago; we had then several large flocks which hovered over some large reservoirs of water, about one mile from this town, about two or three days and then departed.—*James Bladon; Pont-y-Pool, October 15th, 1846.*

Occurrence of the Spanish Sea-bream at Sherringham.—I received yesterday from the Rev. Arthur Upcher, of Sherringham, a specimen of the Spanish sea-bream (*Pagellus erythrinus*), caught off that place. Mr. Upcher states that the fishermen consider it a very rare fish on this coast, and the present is the first instance of its occurrence off the shores of Norfolk that has come under my notice. The length of this specimen was $13\frac{3}{4}$ inches; its greatest depth 4 inches, and its weight 1 lb. $5\frac{1}{2}$ ounces. The colour (roseate and silvery) was brilliant when the fish was first caught. The stomach of the fish was empty.—*J. H. Gurney; Easton, Norfolk, Nov. 14th, 1846.*

Large Sturgeon caught in the Usk.—As an accompaniment to the notice in the 'Zoologist' (Zool. 1419) of the occurrence of the above species of fish in the tributary rivers of the Severn, I forward you the following account of one caught in the Usk, which falls into the estuary of the Severn, about five miles from Newport, in this county. It was caught at Tredunnock, about six miles below the town of Usk, on the night of the 12th of May, by two fishermen from Usk, (Thomas Davies and Zachary Walters) in a salmon net, about one mile above the tideway in the river; a short distance further up the river is so very shallow, as not to admit the use of a coracle, (Usk fishing-boat, made after the manner of the Ancient Britons, of wicker-work covered with leather). It was eight feet, six inches in length, four feet in circumference, and was one hundred and eighty-eight pounds in weight. With respect to its being caught in our rivers, Dr. Fleming states 'British Animals,' p. 173, under "Accipenser sturio," "This species is occasionally caught in the larger rivers by the salmon-nets, in the summer season, having left the sea for the purpose of spawning." N. B. Either there is an error in the date assigned to the note in the 'Zoologist' (Zool. 1419), April 22nd,

or there has been another caught in the Wye, as I have been informed that one was taken about ten days or a fortnight *after* the one caught in the Usk.—*James Bladon; Pont-y-pool.*

Observations on Insect Sensibility. By T. VERNON WOLLASTON,
Esq., B.A., F.C.P.S.

A PAPER has lately appeared in the 'Zoologist' (Zool. 1524) by the Rev. Mr. Turner, in which he accuses me of attacking his observations in an article which I formerly wrote on the question, "Do insects feel, or do they not?" Now I beg to assure Mr. Turner in particular, and the readers of the 'Zoologist' in general, that his accusations are perfectly groundless, inasmuch as I was not even aware that he had written anything whatever on the subject; the "facts" referred to being in reality those single and isolated ones so constantly objected to us by casual observers, who expect from them alone (unmodified by circumstances) to crush the whole theory of insect sensibility, and leap, in one wide presumptuous bound, to the sweeping conclusion, that the entire insect world is destitute of feeling! That something of the sort had been printed in the 'Zoologist,' I was not altogether ignorant (it having been mentioned to me by a friend with whom I was staying last spring); but by whom it was written, at what time it appeared, and what was the exact subject of the communication, were points totally unknown to me; having never even seen the observations, nor having heard anything more about them than the casual mention of them to which I have just referred. As my intention in the article he attacks, was simply to discuss the question in a broad light, and to endeavour to prove from analogy that insects *do* possess feeling (in contradistinction to men who broadly assert that they do *not*), it was not the drift of my argument to upset the observations either of Mr. Turner, or any other naturalist, respecting the "struggles of impaled Lepidoptera," but merely to argue from the analogy of their nervous system to our own, that the third grand department of the animal creation could not be destitute of feeling; and, in so doing, to show that the contrary was not demonstrated by the fact that insects could be impaled when in a state of repose, without displaying an immediate sense of pain. Mr. Turner has certainly fallen into very great error, in supposing that I undervalue the smallest particle of his observations. I think them both in-

teresting and important ; but I do not think them sufficient to establish the sweeping conclusion, that insects are destitute of feeling, (which was all I formerly contended) ; and, if I understand him rightly, he does not think so either ; therefore, what is the point that he would attack ? I give him full credit for his varied observations, and read with pleasure the interesting facts he has adduced ; but of themselves I consider them insufficient to found the theory of insensibility upon, and therefore, *à fortiori*, when in conjunction with innumerable other facts, altogether independent of analogy, which seems to prove the contrary proposition.

Mr. Turner allows that "insects feel," and yet he assumes that "this sensation is not produced by their being impaled" ! Now, if the first (allowance) be correct, the second (assumption) must be erroneous ; for, if they can feel at all, surely they cannot be insensible, when pierced through the very centre of their bodies, although, for a short time after it has taken place, particular circumstances, perchance, may render them so. I should rather consider that, if he assumes the second proposition, he must of necessity, and out of consistency, deny the first. So far, however, as the first is concerned, I should also allow with him "that insects feel" (and certainly if we may appeal to analogy, which at present I will not do, everything tends to show it),—but here we part ; for my next step would not be to assume that feeling "is not produced by their being impaled ;" nor, on the other hand would it be to assume that it is. I confess I should be prejudiced in favour of the latter ; but I should not "assume" it. I should rather go humbly to Nature in the full expectations of finding it the case, and endeavour to deduce it from the observation of facts. This has always been my object, and I confess I have not only never seen anything to negative what both Mr. Turner and myself, in the first instance, allow (*viz.*, "that insects feel") ; but let us look at the positive side of the question, and see what has been my conviction there. The "observation of facts," resulting not only from impaled Lepidoptera (which is merely one condition brought forward on the question of sensibility), but also from the peculiar states (which ought to produce pain, if a sense of pain exists at all) which other insects have been plunged into under various circumstances, has always led me to conclude that their sense of feeling is greater than we give them credit for, and amounts in fact, to a true sense of pain. The instance so opportunely brought forward by Mr. Guyon (*Zool.* 1526) is a striking example of this, and one which has occurred beneath my notice nearly every alternate day during the last

six summers, and always with the same result. Place a bottle of Coleoptera (even in a sleeping state) in warm water, and, singularly enough, in a moment, according to the spirit of Mr. Turner's theory, they are seized with a sudden desire "to escape"! They rush furiously backwards and forwards,—they writhe, apparently in the greatest agony, and in less than a minute they are all dead. It is curious that they should wish so suddenly "to escape,"—for, as Mr. Guyon philosophically adds, the expansion of the glass gives them positively rather more room to walk about in than before; so that their sphere for action would be larger! Hence, we are driven (be it even against our will) to infer that the great commotion which has just taken place, was truly the result of some mighty sensations (call it what we please) and not from a sudden desire to escape. Place any number of insects, of whatever order you choose to select, on a cold plate, and let them remain there, uncovered, until they are quiescent. Let the plate be so situated that you can apply some warming agent beneath it without disturbing its position. Begin the experiment, and you will experience the most exquisite piece of fun imaginable. *Halticæ* immediately hop twice as far as they ever did before,—*Ela-teridæ* bound and crack like parched peas in a frying-pan,—*Brachelytra* scamper frantically over the edges of the plate,—*Harpalidæ* rush off as quick as their legs can carry them,—and all orders and denominations "make themselves scarce" as rapidly as possible; and yet, if Mr. Turner's theory be correct, this is not the result of pain! I allow that these are not parallel cases with the pinning of *Lepidoptera*, but, in the question under consideration, they are as directly to the point. They are strong proofs that insects of all denominations, not only "possess feeling," but also a sense of pain, though this truth be elicited from them under different circumstances. Indeed, the very instances brought forward by Mr. Turner himself, seem to me to tell a similar tale, in a manner perfectly natural and in proportion to the causes he applies. For mark now what would be the natural progress of an insect in an impaled state; and then let us compare it with Mr. Turner's own example and see in what points they differ. But, before doing so, let us not forget that the greatest advocates of insect sensibility, do not give them any extreme sense of pain. In avoiding the rocks of "*Scylla*," they are too wise to fall into the opposite "*Charybdis*." They do not assert that insects possess as much sensibility as we do ourselves, nor even *half* as much; they merely contend that they *do possess* it, and that too, in proportion to their position in the Animal Kingdom. Hence, what would be the *natural* effect when

an insect was impaled in a sleeping state? Its slow circulation and diminished vital force, might, if the operation be done gently, prevent for a long time the creature from finding out its new position. (I cannot assert this from experience, but it is a concession in favour of Mr. Turner's experiments). Now, judging from Mr. Turner's article, the "slow circulation and diminished vital force" have nothing at all to do with the insect not awaking; for he distinctly expresses his opinion that insects are roused "by the change of position caused by the pressure which it is necessary to exert in impaling them." Now, if this be the reason why they do not awake, he must throw the "slow circulation and diminished vital force" out of the question altogether; *i. e.*, he must needs assume that the circulation is not slower, and the vital force not diminished during sleep at all,—a theory quite novel and unique! We all know that, during the season of hybernation, the circulation of animals is so slow as to be scarcely perceptible. I am aware that hybernation is not sleep, and moreover that we know as little of the true nature of the one state as we do of the other; but, so far as circulation is concerned, the first is but an *ultra* state of the second, the question being merely a question of degree. Thus, for example, let us take the case of a common dormouse. Of course Mr. Turner will allow that vertebrate animals possess a sense of pain in the very strictest sense of the word. And yet it is a fact that, when in a state of hybernation, we may do almost anything we please with a dormouse without arousing it. But does this prove that a dormouse has no feeling? Certainly not. Its feeling is as great as in any other animal of its class; but its slow circulation, when in a state of hybernation, prevented it from discovering the experiments made upon it. It is needless, however, to mention facts like these; for it is well-known, that in all animals the circulation is slower during hybernation and sleep than at any other time; and that Mr. Turner cannot possibly throw this grand truth out of the question, even though his own "theories" may tend in the opposite direction. It *must* be taken into account; and, having done so, we at once see what an important fact it is towards explaining the huge mystery why animals, in a state of slow circulation and diminished vital force, may have a wound inflicted on them without their knowledge at the time; and all this without interfering in the least with their sensibility on common and ordinary occasions. I will not appeal to mesmerism to prove that animals of the highest degree of sensibility may exist in states inadmissible to pain, inasmuch as at present too little is known of the subject to be made use of in evidence. But, were we allowed

to do so, numberless are the facts which might be adduced on this interesting point. I do not assert that the mesmeric state is analagous either to hybernation or sleep ; but, be that as it may, it at least tends to prove, that creatures possessing an extreme sense of pain, may exist at times perfectly unconscious of external circumstances, and incapable of feeling what on ordinary occasions they would feel acutely.

The fact, too, of insects living with pins actually *in* them, and performing with apparent unconcern their usual avocations, can cause but little surprise to any one who, like Mr. Turner and myself, can admit the first and greatest mystery, that they may be impaled at all, under certain circumstances, without experiencing any immediate sense of pain. For even in the human subject we have cases almost parallel, therefore why should it be a matter of astonishment in such animals as these ? I myself knew a lady who had the misfortune, in days of yore, to swallow a pin. At first, the wound it produced caused her most excruciating pain, so much so as to give rise to very alarming symptoms. In an extremely short time, however, the wound had healed and the pain ceased, and, although the pin stuck in its original position, she was able to eat and swallow as usual, and no effect remained but an occasional unpleasant sensation. The period I allude to, is more than eighteen years ago, and still the pin sticks where it was, but without causing the smallest degree of pain.

But, leaving this slight deviation from the exact direction in which our history would lead us ; let us proceed in tracing the “ natural progress ” of our impaled moth, and take up the subject at the point where we left it.

So long as the insect was not aroused *at first*, we can easily conceive, from what has just been said, its quiescent ignorance to continue until its proper time for awaking ; but, during that interval, let us not think that nothing has been going on. Nature will not stop her course to please our fancies and indulge our theories. She proceeds,—and although the animal, for the causes previously alluded to, may not perhaps awake, the process of healing is going on. In animals more than half-way down the zoological department, whose nervous systems have no common centre to which external intelligence can be especially directed ; but which possess a series of centres, each probably devoted to its peculiar sphere, and therefore each, so to speak, tending to split up and divide the general sensitive mass (which, in the vertebrate animals, is amalgamated with and conveyed to the one common nucleus) ; it is easy to understand why a fractured

limb or severe wound may speedily heal, and cause, comparatively speaking (even when the creature is *awake*, and therefore, *à fortiori*, during sleep) but a small degree of pain; for that "pain" would not pass throughout the whole system, but would merely be conducted from whatever point at which it might originate, to the small centre especially appropriated as the sensitive nucleus of the proportionally *small space* in some part or other of which that wounded "point" exists.

Hence, taking up the animal where we left it, let us proceed in tracing its progress. The animal is asleep,—it has been pierced through by the pin for a considerable length of time,—the healing has been going on (it has just been shown that it may have been going on very rapidly); it continues slumbering for hours, and it awakes. Now what is the *natural* state of things at this point of its history?—how does it feel?—and what has gone on since it was first impaled? Overwhelmed with pain (modified, I grant, by the healing which has taken place) and a natural desire to escape, it flutters violently. It finds it *cannot* escape, it goes on fluttering. The observer approaches and extracts the pin from the wound; the poor thing (from the healing which has taken place during sleep, and from the exciting cause being suddenly removed) is, comparatively speaking, out of pain; it therefore either becomes quiescent, or, finding itself entirely at liberty, it flies away (we may assume if we please that it flies away free from pain, but we have no warrant for doing so). This is precisely the natural course which inductive reasoning would trace out for an impaled moth. Let us now compare it with Mr. Turner's instance. He says "impale an insect and wait till it is aroused, and its struggles commence. Then, remove the pin, and its struggles will cease." This is identically the same with that we have just shown may be the natural state of things, so far as its progress is concerned. The insect sleeps (not having been aroused for causes already alluded to); it awakes and it "commences struggling." All this is natural enough, but here is the point at which Mr. Turner has fallen into error. He makes no comment upon its "struggles commencing." Because it is the proper time for the insect to fly away, he tacitly assumes that it merely struggles to escape, and does not give it the smallest credit for pain and the desire to escape combined. This he entirely passes over, and adds, "this I think must proceed *either* from the pin-wound causing no pain, or else from the insect finding itself at liberty." Now, what can his "this" refer to? It evidently does not refer to the struggles while they were *going on*, but to his second clause, where he says

"remove the pin and its struggles will cease." He does not explain (because he cannot tell) why the struggles took place; * but, assuming (which he has no right to do) that they took place simply from a desire "to escape," he proceeds to give his reasons why they ceased when the pin was extracted, and says he shall be "content" with either.

Let us now examine his two reasons. The *second* is evidently erroneous, for, if the "struggles ceased" because the creature found itself "at liberty," or, which is the same thing, if they commenced (which, as before intimated, he "tacitly assumes") because it was not at liberty; *i. e.* to say, if they commenced simply from a desire "to escape" (it being the proper time for the insect to fly away); directly the hinderance was removed, it would fulfil its desire and fly, and Mr. Turner would have had no opportunity of seeing whether its "struggles ceased" or whether they did not. Hence, it could not have struggled merely from a desire "to escape."

His *first* reason is most extraordinary and inexplicable. If the "struggles ceased" because the "pin-wound caused no pain,"—why, we ask, were they produced while the pin was actually in the wound and irritating it? Besides, if the "pin-wound caused no pain," there is no reason why the insect should flutter a bit more when the pin was *in* than when it was *out* (inasmuch as, be it particularly observed, it had no desire "to escape," that being the second independent reason which he liberally gives us the choice of). If it struggled (as he allows it did) while the pin was actually in the wound, and ceased struggling when it was out; it clearly proves, that, being relieved from the pain caused by the pin irritating the wound, upon its being taken out it was comparatively at rest.

Hence, Mr. Turner states correctly the natural progress of an impaled moth (*i. e.* in the extreme case which he has taken, of the insect slumbering on until its proper time for awaking; and which, as he has found it to take place at times, I willingly concede to his observations); but he has fallen into error in his after deductions, and assumed the only important part of his whole proposition, *viz.*, the reason why the struggles commenced, and declared it to be solely

* I separate this case altogether from Mr. Turner's other instance, which we have just discussed. For the cause of the struggles which he there assumes (*viz.*, the pressure exerted at the time they are impaled) is only applicable to insects awaking at the moment the pin is inserted. We are now examining his second example, where the impaled creature has been slumbering for hours, and, on awaking at its accustomed time, discovers its unpleasant position.

from a desire to escape. I am aware it is difficult to prove by what cause its struggles began, but that is no reason why we are to take refuge in Mr. Turner's assumption, and deny, contrary to natural inductions that they took place from the desire to escape, and pain combined, particularly when we have seen (thanks to Mr. Turner's own observations) that the struggles were violent when the pin was actually in the wound, and therefore irritating it; but that they altogether ceased when the exciting cause was removed!

Suppose Mr. John Smith (I beg to assure Mr. Turner that I have no reference whatever to *him* in this general and comprehensive name); suppose Mr. John Smith, I repeat, or anybody else was impaled to the trunk of a tree by a large iron-bar, or skewer, fixed through the very centre of his body; and suppose this was done while he chanced to be "asleep" against that tree. Like many insects he would instantly awake and kick vigorously. But why does he kick? From the mere change of position caused by the pressure of insertion? Certainly not. I am aware he would be very glad to get away,—*i. e.* to say, he would have an earnest desire "to escape;" but is this the only reason why Mr. John Smith kicks? No! Doubtless there is another; he is also in pain. A bystander may assume if he pleases that he simply kicks to escape, but inductive reasoning at once assures us that the cause is twofold. And so it is with impaled Lepidoptera. The struggles there also proceed from a twofold cause, although, as we have before stated, the warmest advocates of insect sensibility will not contend that those causes, when compared with the former case, are anything but small.

We have thus examined Mr. Turner's facts; and shown, that, although they are correct in statement (*i. e.* so far as the observed progress of the impaled insects is concerned), the deductions which he draws from his observations are unnatural, and therefore erroneous. And, after assuming, contrary to natural inductions and plain, unbiassed reasoning, the critical part of the whole problem,—*viz.*, that the struggles in question were produced solely from a desire to escape; and after expressing his intentions of being "content with either" of the extraordinary causes he has suggested, by way of accounting for observed facts, he gravely adds that he considers them quite as conclusive as the following argument: "Insects contain neurine,—Mr. Wollaston cannot (*i. e.* from his own confession) separate feeling from neurine; *ergo*, insects feel, and consequently have a sense of pain." Now, since he asserts with such evident compassion that "Mr. Wollaston cannot separate feeling from neurine," I would simply

ask,—can Mr. Turner? If he can, he has done what everybody else has failed in doing, and ought to have immediate credit for the discovery. I am quite sure he would not wish the facts he has adduced to be considered sufficient proof that “feeling and neurine are separable,” inasmuch as we know that the insects he experimented on possessed neurine, and, by his own confession, he does not deny them feeling. Hence, if he has made the discovery, I presume he has a host of facts, as yet unmentioned and of an entirely novel description, in order to prove his point. If he has not made the discovery, *i. e.* to say, if he has failed in proving that feeling and neurine are separable, why does he attack me if I have failed in proving that they are inseparable? It is very certain (and his own confessions show it) that he has not proved them to be separable; and if (as he asserts) *I* have not proved them to be inseparable, we have both failed in our endeavours, and he has attacked me unjustly. For, after having failed on his part, Mr. Turner, as though he had demonstrated his own point satisfactory, coolly requires me to bring forward proofs of mine (*viz.*, that feeling and neurine are inseparable), otherwise, he says, I shall be liable to the charge of “building on probabilities and theories.” Now, I would ask Mr. Turner, how is this to be proved? There are evidently two ways. The *first* is, by observing that the insects in question possess neurine, and then *proving* from experiment that they *have feeling*. The *second* is from analogy.

Regarding the first of these methods, we *know* that all insects “*possess neurine*”; — it has been my object in the present paper to prove (as far as possible, independently of analogy) that they “*have feeling*.”

Regarding the second of the above-mentioned proofs, let us say one word, ere we conclude, upon analogy. It was my intention in the article Mr. Turner has attacked, to endeavour to demonstrate my point simply and purely from analogy; the fact of the contrary proposition not being proved by such observations as those we have examined, forming in truth but a subsidiary part of my argument. Now, it is evident from Mr. Turner’s attack on my former paper that he rejects analogy altogether, otherwise he could not have possibly considered me “building on theories and probabilities” in arguing from the analogy of the nervous system of insects to our own, that they must possess feeling; *i. e.*, that “neurine and feeling in insects are inseparable.” But let me warn Mr. Turner of the fearful effects of once denying the existence of analogy. So far from being “theoretical,” it is the very basis of all inductive reasoning, — the cement which holds

the inductive sciences together. Without it they would all sink, and Geology, which is entirely built upon it, would be the very first to fall. Once, in fact, remove analogy, and there is an end to all sound and legitimate deductions, for it strikes at the very root of reasoning and upsets the principles on which we proceed. If our legs are known to be organs of locomotion, and certain members of other animals are observed to be organs of locomotion also, acting on the same principle and for the same purpose, these organs are called "legs" and are said to be "analagous" to our own, having (in the words of [the very *definition* of analogy) "a similar relation of function." If the eyes of insects are observed by the anatomist to be formed on the same principle as our own,—if they possess the fluids necessary for the formation of proper refracting media, and a retina, stretched out behind, to receive the impression formed by the rays of light, refracted through the fluids, upon its surface,—then are the eyes of insects said to be "analogous" to our own eyes, having, as in the case of the legs, "a similar relation of function." And so it is with the nervous system. The greatest physiologists of the day have allowed it to be the surest basis of arrangement throughout the whole animal kingdom; and, arguing from the analogy which the general systems bear to our own, have separated it into the five grand departments which are recognized by all. Surely then Mr. Turner cannot accuse me of "building on probabilities and theories," in arguing, in my former paper, on an analogy which cannot be rejected without upsetting the very groundwork on which modern physiologists have so cautiously and judiciously advanced. I admit all his facts on the "struggles of impaled Lepidoptera," and read them with interest and delight. I look upon them as strong proofs of what I have already stated, but I can not consider them in any other light. And I can only express a hope that those entomologists who are prejudiced in favour of what I believe to be a solely entomological theory,—the insensibility of the insect world,—will at least consent to view the subject in a broad light, and examine both sides of the question before they finally decide on so large and important a subject.

T. V. WOLLASTON.

Jesus College, Cambridge.

A Supplementary Paper containing descriptions of a few species of Bees recently discovered, or omitted in the descriptions of the Genera to which they belong. By FREDERICK SMITH, Esq.

THIS paper will conclude my descriptions of that division of British bees which have the tongue folded and elongate, and which constitute the genus *Apis* of Kirby. Having arrived at this stage in my description of bees, I trust, that although it will doubtless hereafter be found that I have fallen into some errors, still that I have added something to those materials, with which, united to further discoveries, some future hymenopterist will be enabled to construct a perfect history of the bees of Great Britain. I could have wished that a more able and scientific entomologist had undertaken the task, but having found the investigation of the habits of the Hymenoptera a source of endless enjoyment, I felt that if I were merely to record such observations as I had made upon the history and economy of these interesting creatures, I should be adding something to the general stock, and at the same time might be the means of inducing others to join in the investigation of this most interesting order of insects. Independent of the numerous instances in which I have been able to unite sexes to their legitimate partners, I have been able to add seventeen species to the British list, discovered, but none of them described since the publication of Mr. Kirby's 'Monograph.'

BOMBUS FLAVO-NIGRESCENS, Smith.

Female.—(Length 9—10 lines). Black. The labrum clothed with ferruginous hair. The thorax has a broad band in front, and the scutellum is also clothed with a rich yellow pubescence. Wings fuscous, darkest at their apical margins. The basal joint of the tarsi beneath has the pubescence ferruginous, the terminal joints are ferruginous, and the tips of the claws black. Abdomen clothed with a coarse, shaggy pubescence, a lateral patch of which, on the basal segment, is yellow, and on the fourth and fifth it is of a dirty-white.

Neuter.—Similarly coloured to the female, the yellow bands being generally less bright; it is also subject to the same variety.

Male.—(Length 5—7 lines). Black; the mandibles fringed with ferruginous hairs; the thorax has a broad band in front, and the scutellum yellow, a narrow yellow band at the base of the abdomen, frequently interrupted; the four terminal segments white, the apical one black in the centre.

This *Bombus* is extremely variable in its colouring: to describe all the varieties were supererogatory: those described are the most highly coloured specimens; others occur in which the yellow colouring becomes gradually more and more obsolete, until nearly black, there being only a few pale hairs at the tip of the abdomen; the extreme variety occurring most frequently in the female. Still specimens of the other sexes are sometimes found equally dark.

This bee is very liable to be confounded with the *B. hortorum* and also with *B. soroensis*; but the former bee has a much more angular and pointed abdomen, and I have never known either of its sexes to vary in their colouring: the pubescence of *B. flavo-nigrescens* is also much coarser than in either of the above species. The female of *B. Soroensis* has also usually a faint whitish line of hairs on the margins of the second and third segments. The male of this species may always be distinguished by the colour of the hair on the mandibles, which is ferruginous, in *B. hortorum* it is black; and the latter has not the tinge of yellow intermixed with the white at the tip of the abdomen, as in the male of *flavo-nigrescens*; from the male of *Soroensis* it is abundantly distinct.

I am indebted to Mr. Thwaites, of Bristol, for suggesting the very appropriate name of this bee. Mr. Thwaites was also the first to distinguish this *Bombus* as a distinct species: it is abundant in the neighbourhood of Bristol, from whence I have received a fine series from Mr. Walcott, an indefatigable investigator of British Hymenoptera: it also occurs about London, but not very abundantly.

OSMIA PILICORNIS, Smith.

Female.—(Length 5 lines). Black; a few scattered black hairs on the face and cheeks. Antennæ slightly piceous beneath. Thorax with a rufo-fulvous pubescence above. Wings slightly fuscous, their apical margins darkest. Abdomen short, and its apical segment acute, the first segment thinly clothed with rufo-fulvous pubescence, beneath, densely clothed with black hair.

Male.—(Length $4\frac{3}{4}$ — $5\frac{1}{4}$ lines). Nigro-æneous, finely punctured. Antennæ as long as the head and thorax, having a thin fringe of hairs beneath; the face and cheeks clothed with white pubescence, the vertex with pale ochraceous, and also the thorax above; the anterior femora fringed beneath with white; the posterior femora and tibiæ incrassate, all the tarsi ferruginous beneath. The abdomen has a scattered pale yellow pubescence, becoming pale fulvous at the apex, the sixth and seventh segments are deeply emarginate.

The female of this little bee is very like small specimens of *Osmia xanthomelana*: the general colour being very similar; but it has a more rich fulvous pubescence on the thorax, and only scattered hairs on the face, whereas in *O. xanthomelana* they are dense and black; neither does it vary in size like its congener, little or no variation occurring amongst large numbers which have been captured. The male is easily distinguished by the fringe of hair on the antennæ; the colour of this sex soon fades, its pubescence becoming entirely hoary. Captain Blomer is supposed to have first captured the species, but it was long regarded as a variety of *O. xanthomelana*; subsequently Mr. Thwaites captured both sexes, but it was not satisfactorily proved to be distinct until Mr. Walcott captured it in abundance, and transmitted to me specimens of both sexes, and pointed out its distinctive characters.

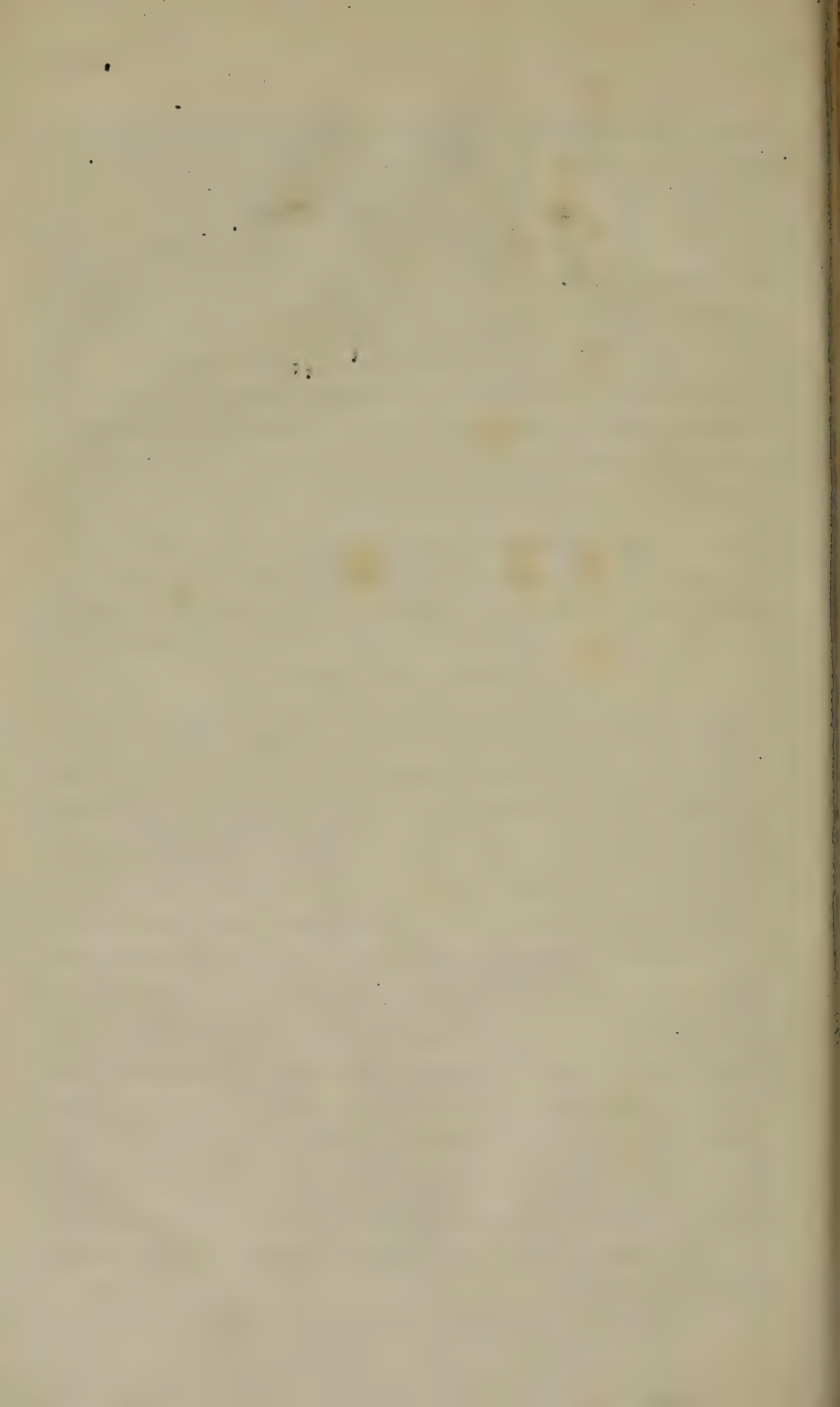
This species appears to be very local; near Bristol it is plentiful: Mr. Walcott has observed that it appears to confine its visits to the flowers of the common bugle. I captured it in April, at Birch Wood, but only a single specimen or two of the female.

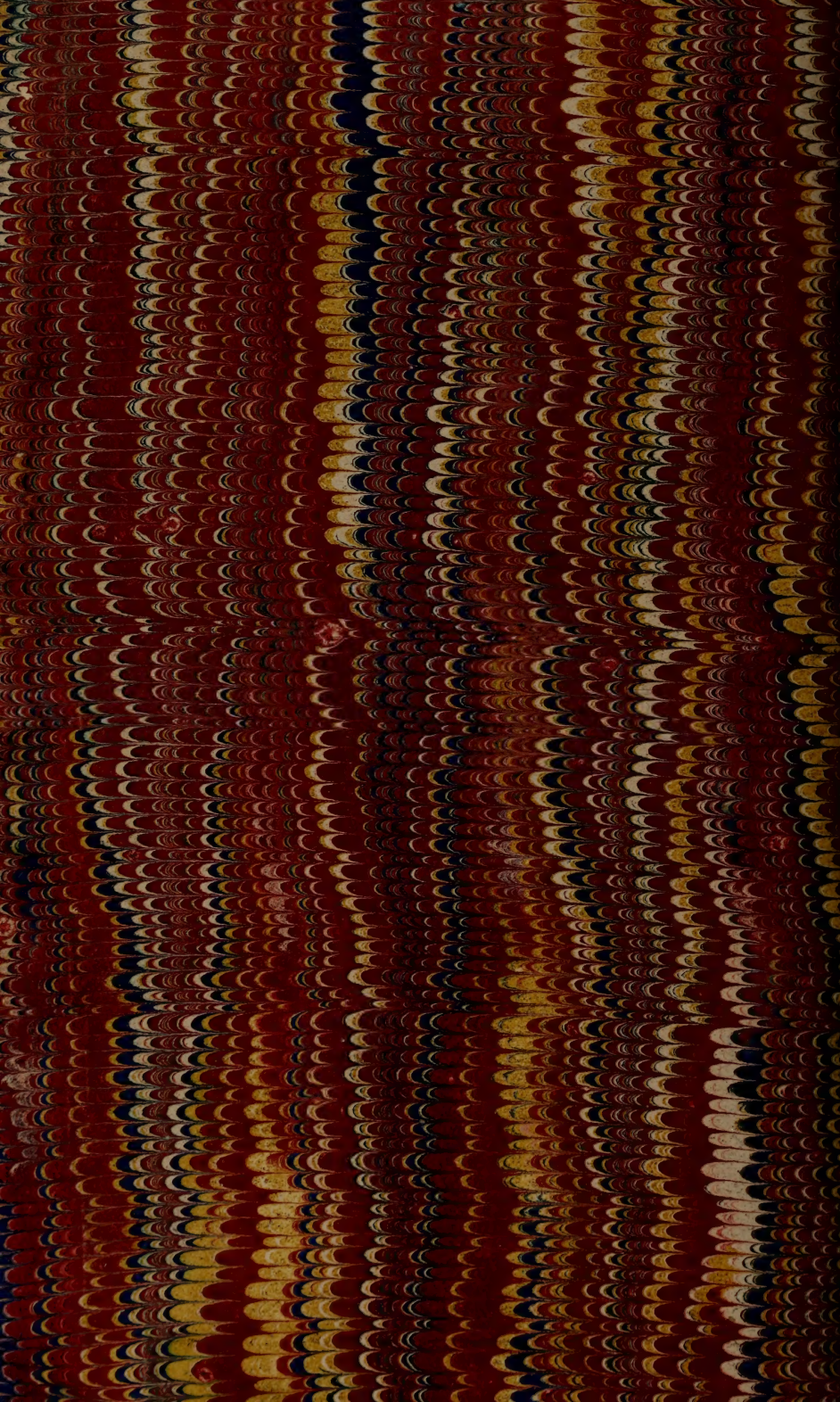
NOMADA ATRATA, *Smith.*

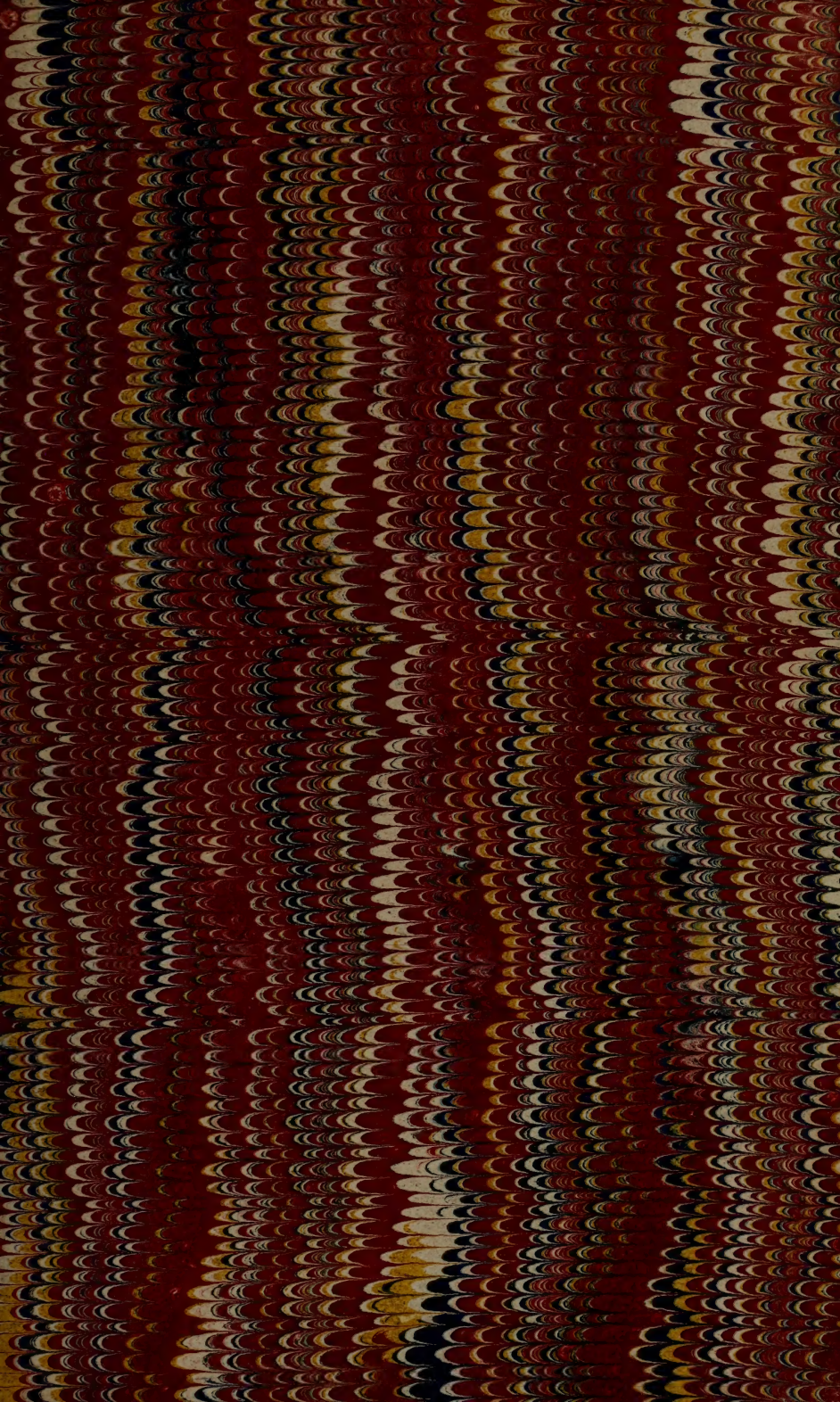
Male.—(Length 3—3½ lines). Black; the antennæ have one or two of their apical segments piceous beneath; the mandibles are ferruginous: the face below the antennæ clothed with a short, silvery pubescence, as are also the sides of the metathorax. The tegulæ piceous. Apical margins of the wings clouded. The anterior femora ferruginous, with a black stain beneath; the intermediate pair ferruginous at their extreme apex; the anterior tibiæ ferruginous, with a dark line above, the intermediate in front and the posterior pair at their apex ferruginous; tarsi ferruginous, the anterior and intermediate pair stained with black above, the first joint of the posterior pair black. Abdomen entirely black, or with the second segment slightly suffused with red; at the extreme lateral margins of the second and third segments above, and on the margins of all the segments beneath interrupted in the centre, is a short, silvery pubescence.

This insect, in its colouring, forms a perfect contrast to the usually gay coloured species of the genus; I do not know the female. The specimens which I possess were captured by my friend Mr. S. Stevens, at Arundel, in Sussex, to whom I am in this, as well as in other instances, indebted for species either new, or of extreme rarity.

FREDERICK SMITH.







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